TELEPHONE and Management ENGINEER

TECHNOLOGY DEPT.

#9

SEPTEMBER
1955

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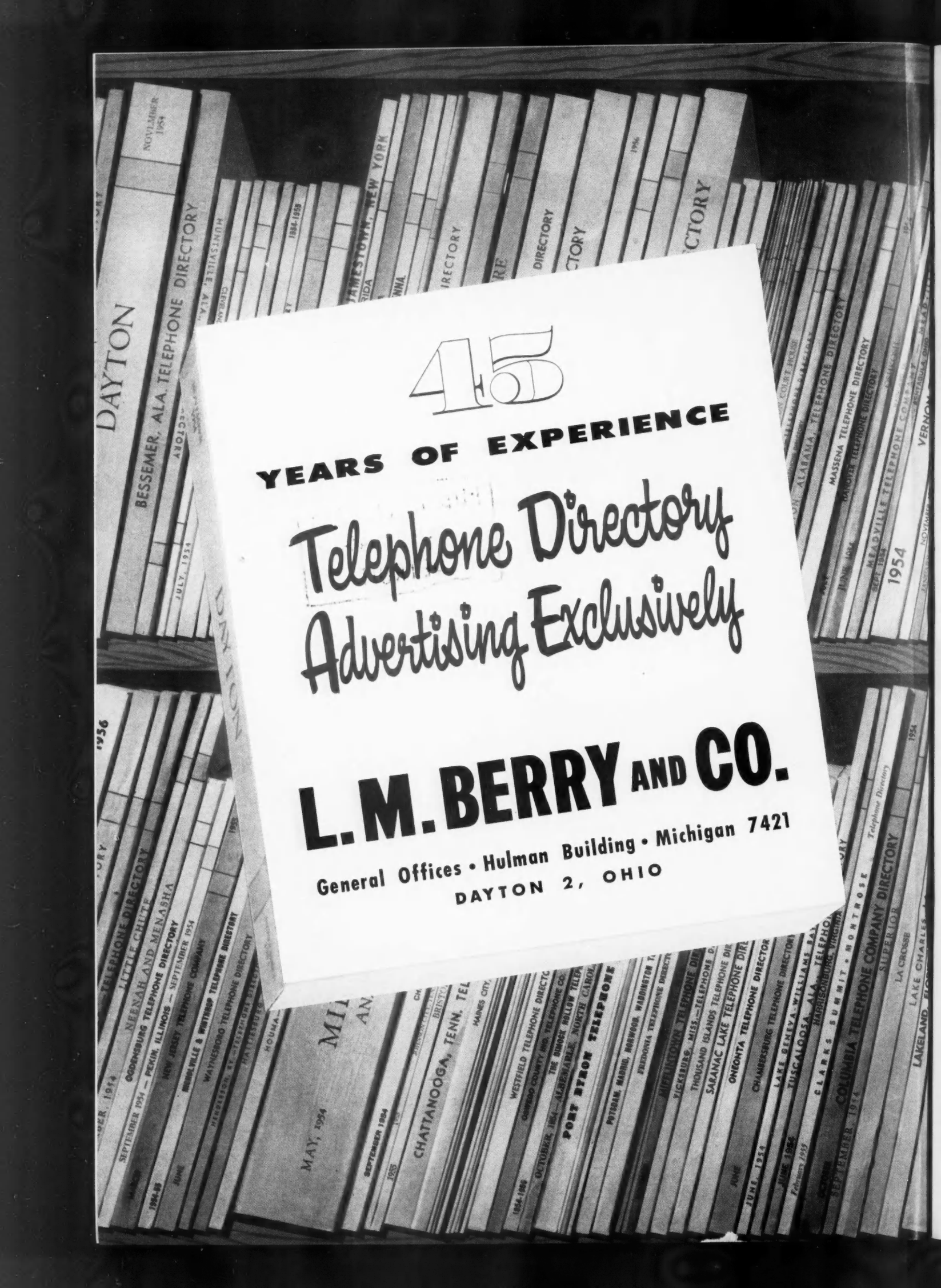
THE NATIONAL TELEPHONE MAGAZINE

Featuring In This Issue—

★ THE INDEPENDENT'S & NATIONWIDE TOLL DIALING, by L. A. Hodson
★ THE CABLE PLOW TRAIN, by T. W. Mounteer
★ MODERN CABLE CONSTRUCTION, by John S. Reed
★ GUIDE FOR TRAINING TRAFFIC EMPLOYES, by Ruth S. Richards
★ SMALL COMPANY TALK, by W. F. Connor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FOR SYNCHROMONIC RINGING!

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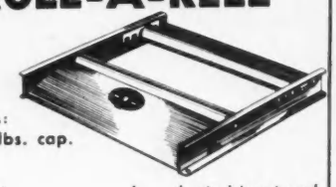

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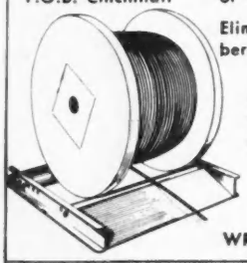

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By J. Raleigh Nelson

University of Michigan
College of Engineering,
Professor Emeritus of English,
Third Edition, 356 pages, 5½ x 8½, 238 illustrations, $4.50

This practical guidebook takes up scores of specific points in the design and composition of the report and gives you exact directions for the setup of both long- and short-form reports, with numerous examples to guide you. In addition, the book outlines a system for the critical examination of the report to help you make sure it will meet the requirements of those who will read and use it.

Telephone Engineer Publishing Corp.

7720 Sheridan Road Chicago 26, Illinois

TELEPHONE and Management ENGINEER

A Telephone Engineer Publication

SEPTEMBER 1955
Vol. 59 No. 9

The National Telephone Magazine

Editor, **RAY W. SMITH** • *Advertising Director,* **ROY F. SMITH**
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FRONT COVER

Photograph of the dinner party honoring C. E. Schafer, secretary-auditor of the Citizens Independent Telephone Co., Terre Haute, Ind., who resigned to accept a similar position with the Home Telephone & Telegraph Co., Fort Wayne, Ind. Associates honoring him (standing, left to right) J. P. BERRY, JOHN C. McATEE, PAUL F. STEARLEY, RONALD LUTHER, CHARLES DRESSLER, ERIC BACKUS, and ROBERT MUTCH. SEATED, (left to right): — S. B. DIBBLE, C. E. McCORMICK, CLIFFORD E. SCHAFER, O. B. GORDON, and WALTER C. EISENHUT.

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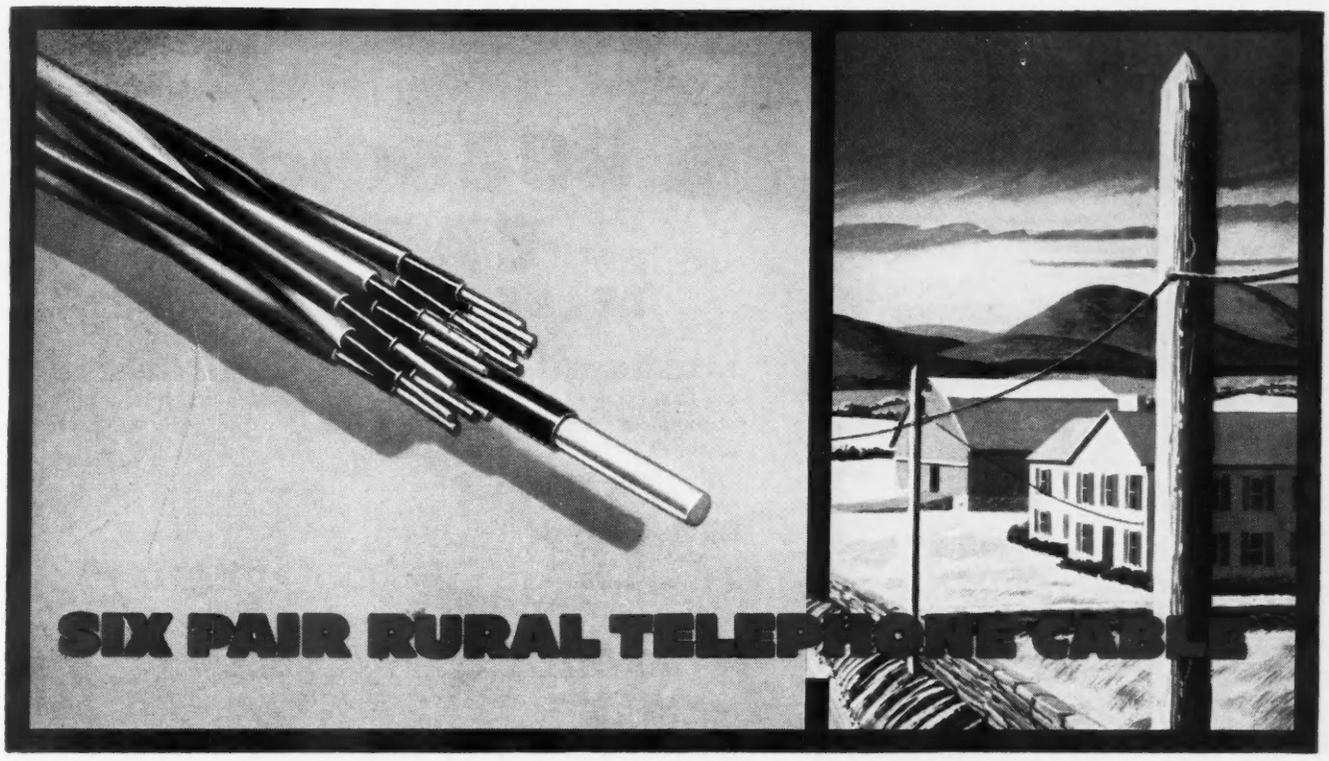
GENERAL CABLE

THE GREATEST NAME IN ELECTRICAL WIRE AND CABLE



Check these outstanding advantages built into General Cable's all-new distribution cable: lightweight, small size, full color coding, extra long lengths. and extra strength for longer spans.

Its electrical characteristics are excellent . . . low-loss transmission . . . low capacitance . . . and high dielectric strength.

This self-supporting cable considerably cuts down installation and maintenance costs! It can be directly attached to poles, eliminating the use of cross arms, hardware, and insulators and reduces tree trimming. Where poles are now crowded, capacity can be increased by six pairs with this cable at minimum cost. Every circuit easily accessible.

For better transmission . . . all conductors are 19 gauge soft drawn copper wire. *For longer service life* . . . the support wire is completely covered with polyethylene and the conductors are insulated with polyethylene and jacketed with colored polyvinyl. *For longer spans*...extra high strength (1,800 lbs.) galvanized steel support wire is used.

General Cable's Six Pair Rural Telephone Cable offers you many other advantages . . . economy, performance, and neat, colorful appearance. Remember, General Cable: producer of the most complete line of telephone wire and cable...largest supplier to the independent telephone companies. Specify "General Cable" for uniformly high quality and quick delivery, through strategically located warehouses.

For information and service see our national distributors:

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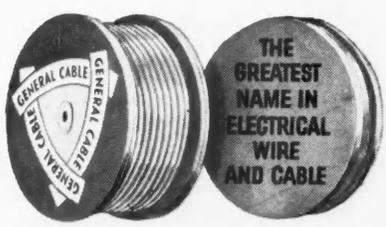
GENERAL CABLE
CORPORATION



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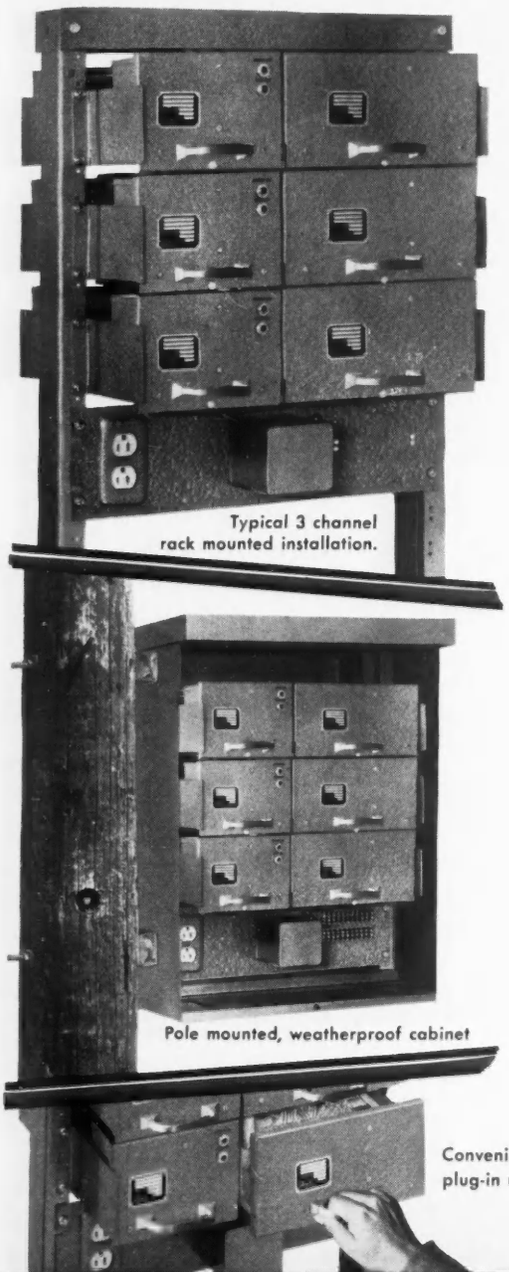
LYNCH B-120

Increased revenues at minimum expenditure

SUBSCRIBER CARRIER TELEPHONE SYSTEM



Typical 3 channel rack mounted installation.

Pole mounted, weatherproof cabinet

Convenient, plug-in units.

B-120 is a flexible carrier telephone system designed expressly for use in subscriber service applications. It provides a simple, highly economical means for increasing the capacity of a party line by a factor of five— B-120 coordinates in every respect with toll carrier system standards.

LOW COST...

B-120 equipment investment... Average $125.00 per subscriber (on ten party circuits).

LOW ANNUAL COST...

Minimum capital investment... Minimum maintenance.

LOW INSTALLATION AND OPERATING COSTS

Installation averages less than one, (1) man-day.

Automatic operation from batteries during power failure (optional).

PLUG-IN UNITS...

Identical, interchangeable Central Office signaling units.

Identical, interchangeable Subscriber signaling units.

Field maintenance work is simplified.

SIGNALING...

Central Office, (common battery) to Subscriber—frequency selective ringing on a Tip, Ring or Bridging basis.

Subscriber, (common battery) to Central Office—dial or switchhook supervision signaling.

REDUCED CIRCUIT NOISE...

Carrier circuits used are normally quieter than physical circuits.

REDUCED TRANSMISSION LOSS...

High carrier gain overcomes wire losses, provides clearer signals at extended distances.

Wide, carrier-derived voice band gives high quality circuits.

COORDINATION...

B-120 Subscriber Carrier can be used on pole lines supporting toll carrier circuits. Single sideband, suppressed carrier transmission and frequency allocations will coordinate with, and minimize crosstalk to, toll carrier circuits.

LYNCH CARRIER SYSTEMS INC.

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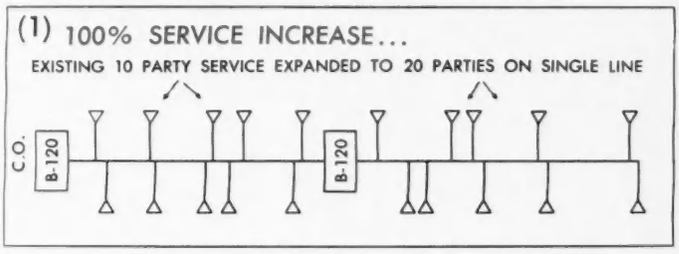
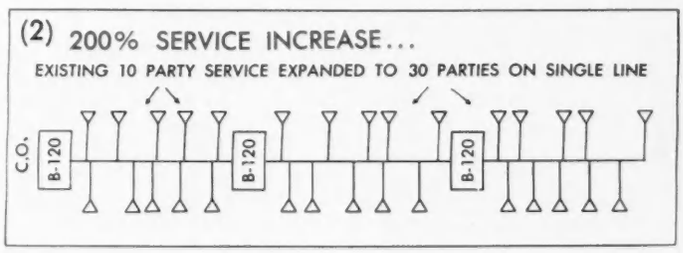
Now in full production for fast delivery schedules.

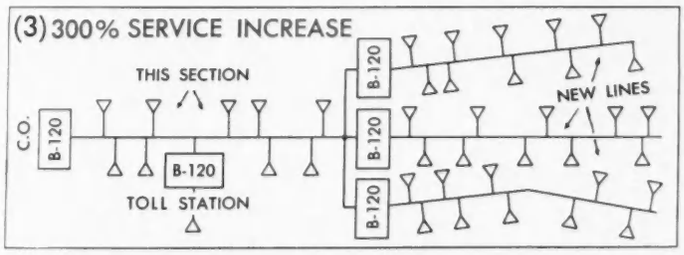
COMPLETE ACCESSORIES...

Available accessories include: line filters, way station filters, transfer filters, power transfer panels, auxiliary connection panels, weather-proof pole mounted cabinets.

INCREASED-REVENUE APPLICATIONS...







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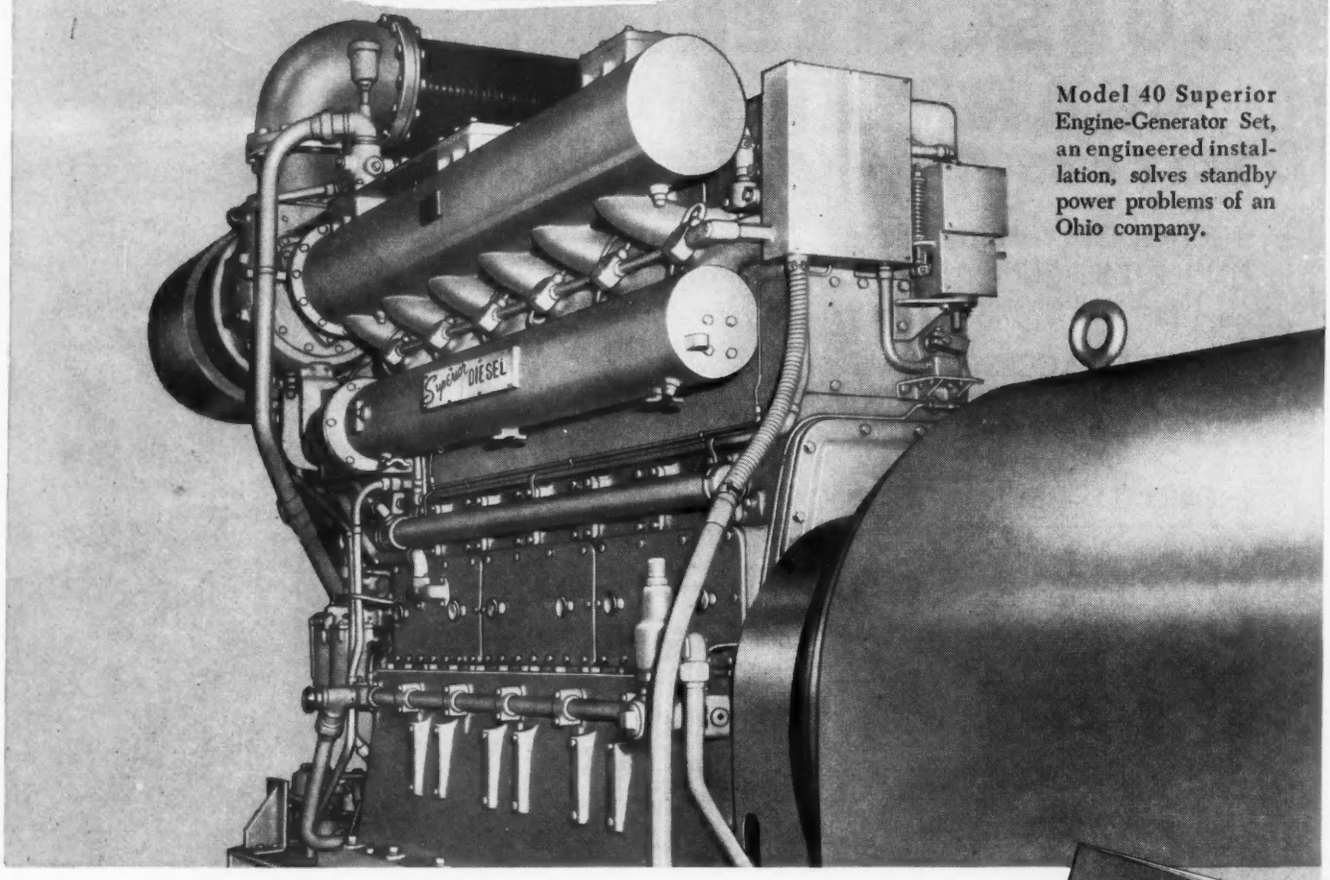
Lynch CARRIER SYSTEMS INC.

LYNCH is one of the pioneer, recognized manufacturers of toll carrier equipment,—is in a position to supply fully the needs for integrated carrier systems, toll, subscriber, radio channeling, telegraph, telemetering, etc.

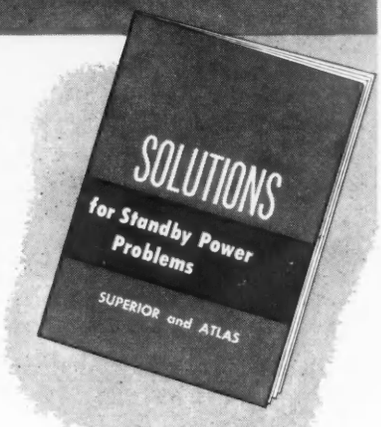
see how

Superior or Atlas Engines

solve your **standby power** problems



Model 40 Superior Engine-Generator Set, an engineered installation, solves standby power problems of an Ohio company.



Engineered installations of Superior and Atlas Diesel, dual fuel and gas engine-generator sets have solved hundreds of standby power problems! In many cases they've paid for themselves. Their automatic start and stop operation often averts tragic consequences, by providing efficient, dependable power for essential plant services in every instance of main power source failures. In order for you to have all the facts and figures we've prepared a special case history file. It shows many instances of how our skilled engineers assisted in solving serious problems involving special considerations and peculiarities in individual installations. Chances are many of the installations will be similar to yours. This information will prove a valuable aid in your planning.

Write, on your letterhead, requesting this file of helpful examples. White's skilled engineers, with years of experience in developing engineered installations of Superior or Atlas engine-generator sets, will assist you in engineering the proper standby power for your specific requirements.

WHITE DIESEL ENGINE DIVISION

THE WHITE MOTOR COMPANY • ***Plant and General Offices: Springfield, Ohio***

Superior ENGINES · ATLAS Imperial DIESEL ENGINES · White DIESEL

NEWSLETTER
TELEPHONE ENGINEER

Fortnightly TELEPHONE ENGINEER ★ TELEPHONE ENGINEER AND *Management*
ON THE 1st OF EACH MONTH ON THE 15th OF EACH MONTH

September 15, 1955

Dear Sir:

U-S-I-T-A CONVENTION: – A broadened perspective will be reward for everyone attending 1955 U. S. I. T. A. convention in Chicago on Oct. 10-12. U-S-I-T-A is planning unusual array of distinguished speaking talent. Conrad Hilton Hotel, as traditional headquarters for annual conclave, will be full to overflowing with Independent telephone men & women anxious to expose themselves to latest in industry thought on operating problems & newest in equipment & supplies. It is going to be great gathering, another in long series of constructive & helpful meetings intended to assist in elevatingsights & service standards. We suggest you write Conrad Hilton for your reservations now.

* * *

CUTS & MATS OF NEW EMBLEM AVAILABLE: – U-S-I-T-A has advised that cuts & mats of new Independent Telephone industry emblem can be obtained from Telephone Advertising Institute, 205 North LaSalle St., Chicago, Ill., which also distributes to entire industry tie-in material in connection with national advertising program. Non-members of Institute may order 2-col. x 8" mat containing 5 different sizes of emblem in both of its versions for sum of one dollar ($1.00). Check must accompany each order. Subscribers to Institute's complete service will receive these mats as part of their regular package at no extra charge. If you are interested in cuts, in addition to mats, prices & sizes easily can be obtained by dropping inquiry to Institute.

As soon as indication of demand can be received so that prices can be established, U-S-I-T-A states emblem will be made available in such other forms as decals, posters, large blow-ups, etc., for use on trucks, telephone booths, buildings, signs, company letterheads, & telephone directories. Items available also will include standard adaptations of emblem printed on "Scotchlite" reflective sheeting, as soon as enough customers make their wants known. U-S-I-T-A is urging member companies to indicate to Institute as soon as possible items which they are interested in ordering. Such procedure will greatly facilitate the entire production & distribution program.

* * *

AUTOMATIC DIAL RADIOTELEPHONE SERVICE to bring communications for first time to large segment of nation's isolated rural population, or to provide common carrier mobile communications in remote areas not presently served, was projected in request to FCC Chairman George C. McConnaughey last month from Rural Electrification Administrator Ancher Nelsen asking FCC rule changes to permit unattended use of radio relaying stations necessary to dial operation.

Mr. Nelsen asked for either a "favorable interpretation" of existing FCC rules, or for any changes "which may be necessary to provide dial radiotelephone service to potential mobile subscribers and isolated fixed rural subscribers whom REA telephone borrowers cannot serve by wire lines or other conventional means." Proposed operation would obviate

need for operators on all but long distance calls, where connecting company (Bell or larger Independent) would provide operator.

SURVEY OF REA'S FARM TELEPHONE LOAN PROGRAM to find out what present & potential borrowers do or do not like about it, was recommended by group of consultants to REA Administrator Ancher Nelsen at their meeting with agency officials in Washington. Consultants proposed that survey be used to obtain "suggestions which would make loan requirements more nearly fit the needs and abilities of applicants." Results of the survey would be for confidential use of REA Administrator & staff. Consultants also made several other recommendations, including one that REA take leadership in sponsoring & scheduling accounting, management, public relations, & engineering seminars for REA telephone borrowers "and all other interested parties, in cooperation with representatives of the telephone industry."

* * *

COPPER SUPPLY PIPELINES were starting on their way to being refilled last month, and while most stocks of copper are not expected to return to normal until early next year, return of last of striking miners & smelter workers to their jobs means improvement in tight copper situation in near future. Communications manufacturers generally were able to continue their production schedules during walkouts by emergency salvage & supply methods.

* * *

DONALD C. POWER, president of General Tel. Corp., was elected vice chairman of Section on Public Utility Law of American Bar Association at annual ABA convention in Philadelphia last month, & thus is in line to be named chairman next year. Ralph M. Besse, vice president of Cleveland Electric Illuminating Co., is this year's Chairman. Section meeting at the convention was devoted principally to discussion of payment to public utilities of their relocation expenses in federal-aid highway construction.

* * *

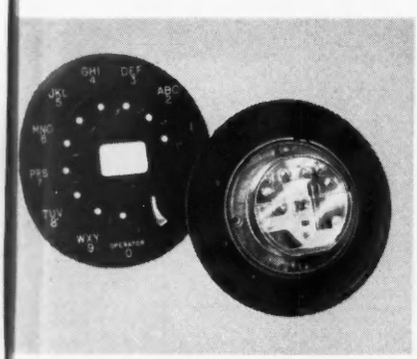
HIGHLIGHTS: – John G. Peters, dist. mgr., United Tel. Co. of Mo. announced plans for converting Weston, Mo. exchange to dial operation . . . Bellamy Tel. Co. will convert Knoxville, Ia. to dial by Oct. 1956. Exchanges at Pleasantville & Lovila will be converted by 1958. Cost of projects exceeds $520,000 . . . Leland Scott, owner of Eagle Bend (Minn.) Tel. Exchange Co., purchased telephone property of Eagle Bend (Minn.) Tel. Assoc. . . . Robert Mutch named sec. Citizens Independent Tel. Co., Terre Haute, Ind. He had been assistant sec. & auditor Blue Mountain Tel. & Tel. Co., Bangor, Pa.

Wallace & Associates Tel. Co., Britton, S. D., completed incorporation procedure. Directors are: Melvin Reyelts, Samuel Aeilts, Fred Mellenberndt, Eugene Auwarter, and Maurice Jones . . . McDonough Tel. Co-op, Adair, Ill., purchased Raritan (Ill) Swbd. & Tel. Co. . . . D. W. Wright named mgr. Reno (Kans.) Tel. Assoc., Inc. . . . Homer Rice, district commercial mgr., General Tel. Co. of Ohio, announced Antwerp, Payne & Hicksville will be converted to dial in November.

Ray Smith

Ray W. Smith, Editor

How to save dollars instead of pennies



"Imitation is the sincerest flattery." We're gratified that the dust-cover we pioneered seven years ago has become practically standard in the industry.

There's no percentage in saving a few cents, when you purchase parts, if it results in *sending a man* to make replacement at more frequent intervals because of inferior quality.

Dials, cords and maintenance items in subscribers' equipment should be bought with that philosophy in mind. The longer they last, the longer they go without need for service, the more you *really* save!

When you order a replacement part from Stromberg-Carlson, you get the same high-quality unit you'd receive if you ordered a complete telephone system. Spare parts and complete units are all made to the same standards.

Make it Stromberg-Carlson—and you'll likely save dollars instead of pennies.

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"Line supplies are line supplies, what's so different about KELLOGG?"

Ed: Plenty, Bill. Kellogg gives us so many good reasons for going to them for all our materials and equipment.
It's not only the quality of their products, it's all the things that go to make up their line supply service.

Bill: For instance?

KELLOGG — DIVISION OF IT&T — KELLOGG SWITCHBOARD AND SUPPLY COMPANY

A Division of International Telephone and Telegraph Corporation

SALES OFFICES: 79 West Monroe Street, Chicago 3, Illinois

Ed: Delivery for one thing — it's fast and dependable. They've got a well stocked warehouse within quick-delivery distance and a flock of supplier distribution points in this area. The closeness of these supply sources has helped us out often in emergencies. Saves us money on shipping costs too.

Bill: That sounds ok.

Ed: Kellogg has always had everything we've ever needed, I don't care what it was. We can write out an order and know it will be filled. One source-for-everything also saves us a lot of time and paperwork.

Bill: Makes good sense.

Ed: And there's this important fact, Bill, no one has more experience than Kellogg in the handling of line supply orders. They seem to understand our problems and come up with the right answers. We leave a lot of decisions up to them and they always come through with the materials that fit our needs.

Bill: Good products, fast, dependable delivery and helpful service... you're right, Ed, I can see why it's always been Kellogg around here. Better keep it that way!

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UNITED STATES INDEPENDENT TELEPHONE ASSOCIATION

Delivery...

Making available the very best equipment and materials is one thing, but getting them to you on time, wherever you happen to be, and at a minimum shipping cost is another. That's something we've always boasted about and rightfully so, too. For Kellogg with six branch warehouses and over 100 supplier distribution points at its disposal, can ship your order from the location nearest you. This way we're able to get the order to you faster and at a savings in shipping costs. Why not give us a try on your next line supply order?

KELLOGG SWITCHBOARD AND SUPPLY COMPANY

A Division of International Telephone and Telegraph Corporation

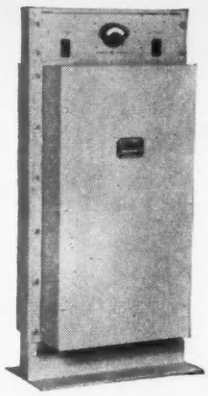
Sales Offices: 79 West Monroe Street, Chicago 3, Illinois

KELLOGG DIVISION OF IT&T

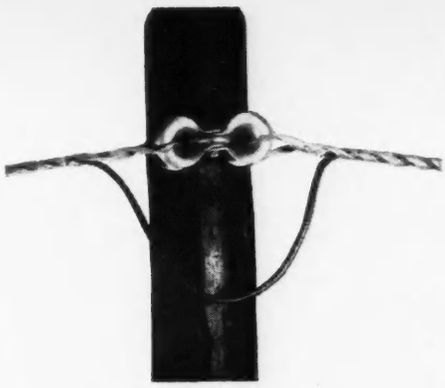
for

Line Supplies

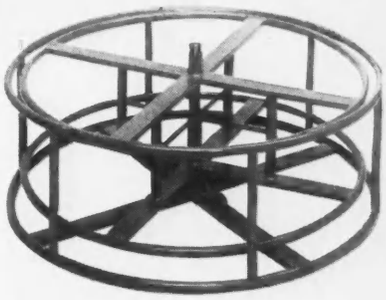
INDEPENDENT



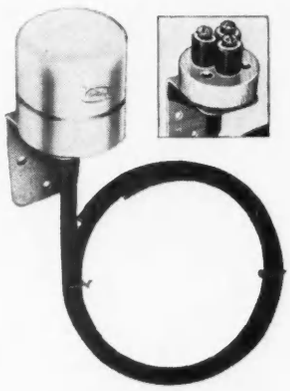
Automatic Constant Voltage Charger—operates without moving parts. Compensates for changes in input voltage and load. Single-Phase Flotrol in the 24 and 48 volt types are available in range of sizes from 1 to 24 amperes. LORAIN PRODUCTS CORP.



Dead-Ends for Plastic Cable —Designed for thermoplastic insulation, this fitting protects while firmly holding cable in elongated grip in which the unit pressure is small because of large area of gripping surface. PREFORMED LINE PRODUCTS CO.



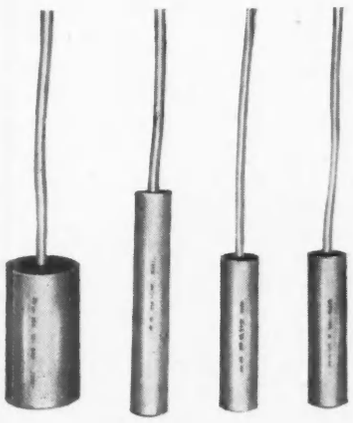
Squirrel Cage Payout Reel No. 700 is built to pay out stiff and stubborn wire. Mounts vertically in or on service trucks or used horizontally any place. Stationary or adjustable pins available for various inside diameters of coil. Made by NEAL COMPANY.



The Cook Hy-Cap Power Cross Protector is designed for use where there is a possibility of contact between communication circuits and power circuits. It also will furnish considerable protection from lightning damage. A product of COOK ELECTRIC COMPANY.

The Time-Tested Steel Strand. A ductile, adherent zinc coating applied by the famous Crapo Galvanizing Process, provides lasting protection against corrosion in INDIANA STEEL & WIRE CO.'s Crapo Steel Strand. Minimum maintenance expense.

Kellogg's Standard Outside Plant Handbook now available at special price while quantities last. Reduced to $2.75 a copy with ten or more copies priced at $2.50 each. Every phase of outside plant telephone pole line construction is covered in book.



Application of Loading Coils on telephone circuits, reduces loss to 1/3 or 1/4 the non-loaded value — coils shown are used on a 2-wire telephone circuit in non-quadded paper insulated or plastic cable. COMMUNICATION EQUIP. & ENGRG. CO.

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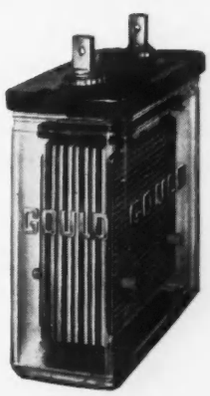


Outstanding Battery Performance is yours when you choose Gould Plante' Batteries. Thick, grooved, pure lead positive plates give many years of trouble-free service! Made by GOULD-NATIONAL BATTERIES, INC., the finest money can buy.

Not a clerk in the store (it's Sunday) . .

but the customers are ordering as usual!

Reaching out for more business against stiff competition, this alert department store takes phone orders on Sundays, although there's not an employe in the store. The store's "order takers" are a battery of Peatrophone mechanical telephone answering instruments.

When a customer, enjoying a leisurely breakfast over the big Sunday newspaper, spies a good buy in one of the store's ads, she doesn't have to wait till Monday to place her order — she reaches for the phone while she's still "red hot," and one of the Peatrophones answers her call, records her order, name and address. Monday morning, the regular order clerks play back the Peatrophone recording and fill the orders for prompt delivery.

Peatrophone has all the right qualifications for the job: 1. Phoned-in orders are recorded on a disc for permanent reference — to avoid errors and to provide a check in case of later complaint. 2. Recordings cannot be wiped off accidentally — no chance of disappointing customers with "lost" orders. 3. The store's talk-out messages can be recorded right on the machine — convenient for announcing last-minute price changes or corrections.

Here again, Peatrophone turns in a profit to user *and* telephone company, building *extra* business for both. Are you keeping up with today's business demands by offering Peatrophone rental service to your subscribers? Let Peatrophone go to work for them — and add this new source of revenue to your company's services.

Write today for complete information on Peatrophone.

TELEPHONE ANSWERING & RECORDING CORP.
342 Madison Ave. New York 17, N. Y.

Lower installation costs with Copperweld LINE WIRE

Many companies have found that it costs less to install Copperweld* Line Wire than any other type. It's light in weight, smooth, easy to handle and economical to string, even on the longest spans. Next time you order line wire, specify "Copperweld." You'll find it pays!

TWO POPULAR SIZES

.104"-40 High Strength for toll lines and long subscriber loops.

.080"-30 Extra High Strength for short subscriber loops and secondary toll lines.

*Trade Mark

1955 – our 40th year

COPPERWELD STEEL COMPANY
WIRE AND CABLE DIVISION
Glassport, Pa.
For Export: COPPERWELD STEEL INTERNATIONAL COMPANY, New York

COPPERWELD NON-RUSTING LINE WIRE and GRIP-FLEX TIES ... The Ideal Combination

SOLD BY LEADING DISTRIBUTORS

Bell System Holds Sales Meeting Via TV

THE BELL SYSTEM put its intercity facilities to work last month to show telephone people in the field new ways to merchandise long distance telephone service.

It was the first time the Bell System has used closed circuit television for a sales meeting. The special network for the occasion extended to 47 cities — reaching more than 2,000 long distance salesmen and other representatives of the Bell System and Independent telephone companies.

Techniques of merchandising efforts to tailor telephone services to meet the particular requirements of business — in this case, the florist field — were featured in the hour-long program originating in color from the Colonial Theater in New York.

The closed circuit color telecast provided a quick and dramatic presentation of the "sales package" developed to help promote the sale of flowers while advertising the use of long distance. The "Flowers by Long Distance" sales plan grew out of ideas and suggestions furnished by Sales and Servicing people of Bell Companies.

Long distance, the telecast pointed out, offers florists not only fast and sure service but also the benefits of two-way personal contact between florists — the opportunity for development of reciprocal business, assurance of delivery and substitution arrangements.

Included in the sample "sales package" shown in full color on the program were: distinctive emblems for florists' windows (telling the public that this florist "Speeds your flowers by Long Distance"), window and counter display cards, and a pamphlet for florists, suggesting how to use long distance to best advantage.

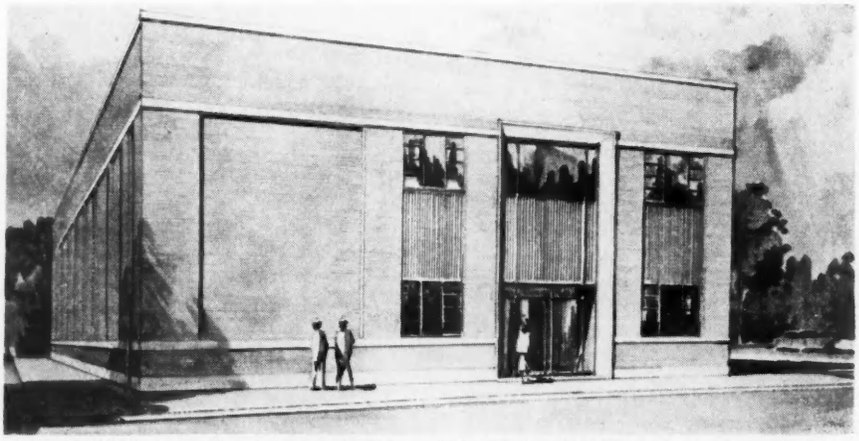
The closed circuit program was developed and produced by A. T. & T.'s Operating and Engineering sales people, and Long Lines sales and merchandising organizations. The network reached from Boston to Los Angeles, from Seattle to Miami, from Montreal to New Orleans — for a total of 50 viewing locations in 47 cities.

Submarine Cable To Link U. S. A. With Hawaii

WITH THE LAYING of a transatlantic telephone cable started less than two months ago, the American Telephone & Telegraph Co. and the Hawaiian Telephone Co. have announced plans for a similar cable linking the United States mainland with the Hawaiian Islands.

The new cable will become the longest single underwater telephone link in the world, topping the 2000-mile span of the portion of the Atlantic system between Scotland and Newfoundland by 100 miles. The repeatered, twin-cable Hawaiian system, which is expected to be ready for service early in 1958, will have practically the same design as that of the transatlantic link and of the telephone cable to be laid in 1956 between Ketchikan, Alaska, and Port Angeles, Wash., near Seattle. It will cost about $35,000,000 — the same as the Atlantic system.

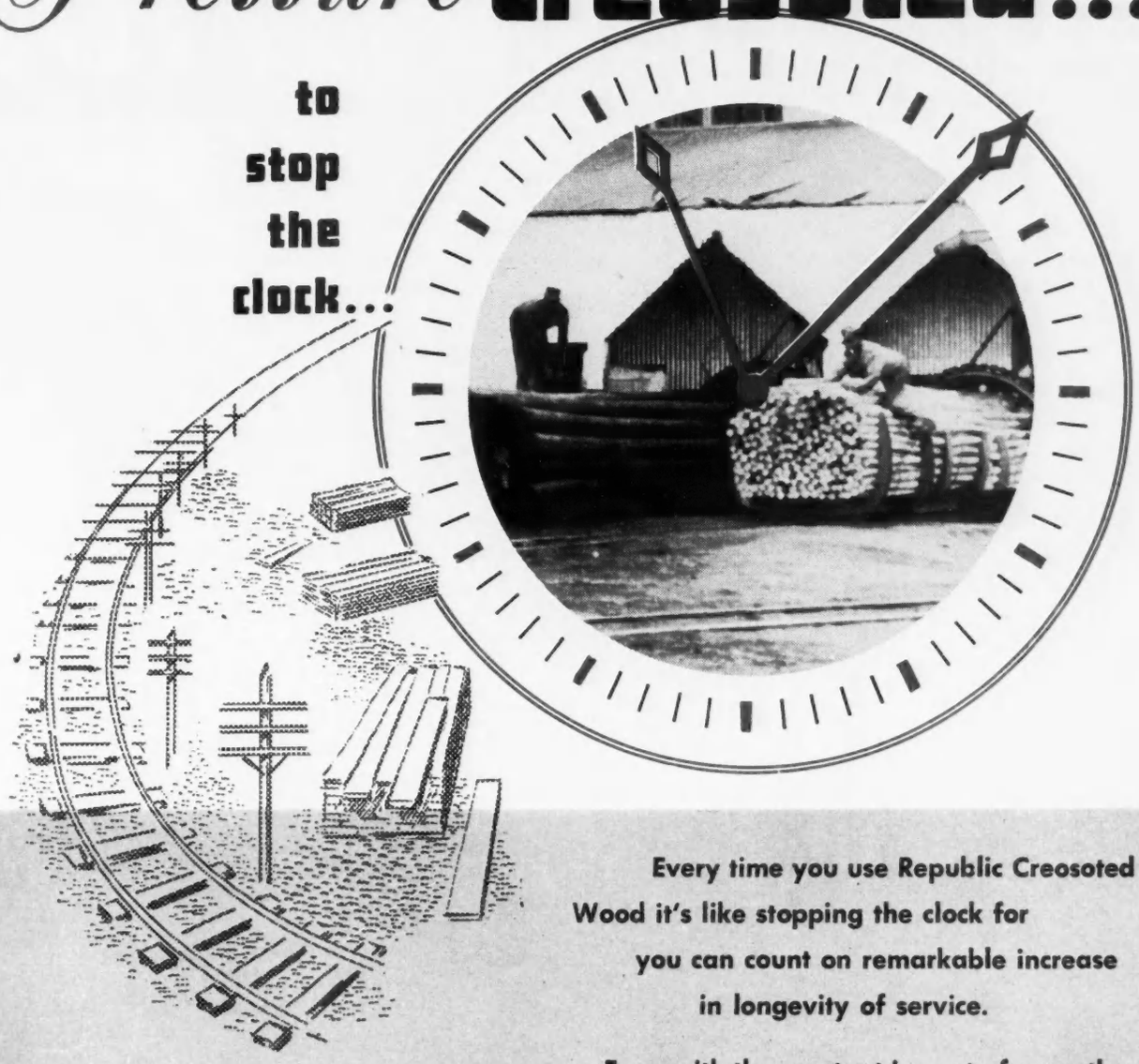
Engineering work on the Hawaiian



NEW OPERATING and headquarters building of the Elyria (Ohio) Telephone Co. will house the company's new dial and long distance systems. The building and equipment will cost approximately $1,415,000. This is the final step in the company's $5,000,000 expansion and improvement program which has been under way for five years. It includes three automatic sub-stations and the complete overhauling of the outside wire and cable plant. The telephone building will contain 42,000 square feet of floor space. The plan provides for two additional stories and there is ground space for an addition. The exterior will be brick and stone with aluminum panels and trim at the public entrance. There will be no windows in the building, which will be air conditioned throughout.

Pressure Creosoted...

to stop the clock...



REPUBIC CREOSOTED
RAILROAD TIES
LUMER
WOOD BLOCKS
CROSS ARMS
POLES

Every time you use Republic Creosoted Wood it's like stopping the clock for you can count on remarkable increase in longevity of service.

Even with the constant impact of more than 25 years of heavy rail traffic, many road beds still have the *original creosoted* cross ties in service . . . . . this is but one example of the proved effectiveness of Republic Creosoted Wood products.

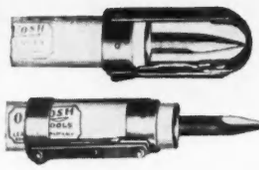
It is good business to rely on Republic pressure creosoted wood, backed by a record of over 50 years in service.

Republic
CREOSOTED PRODUCTS

REPUBLIC CREOSOTING COMPANY

Merchants Bank Building
Indianapolis, Indiana

CONSTRUCTION



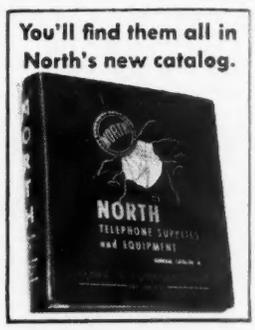
Oshkosh Pike Pole Guards
AP 10

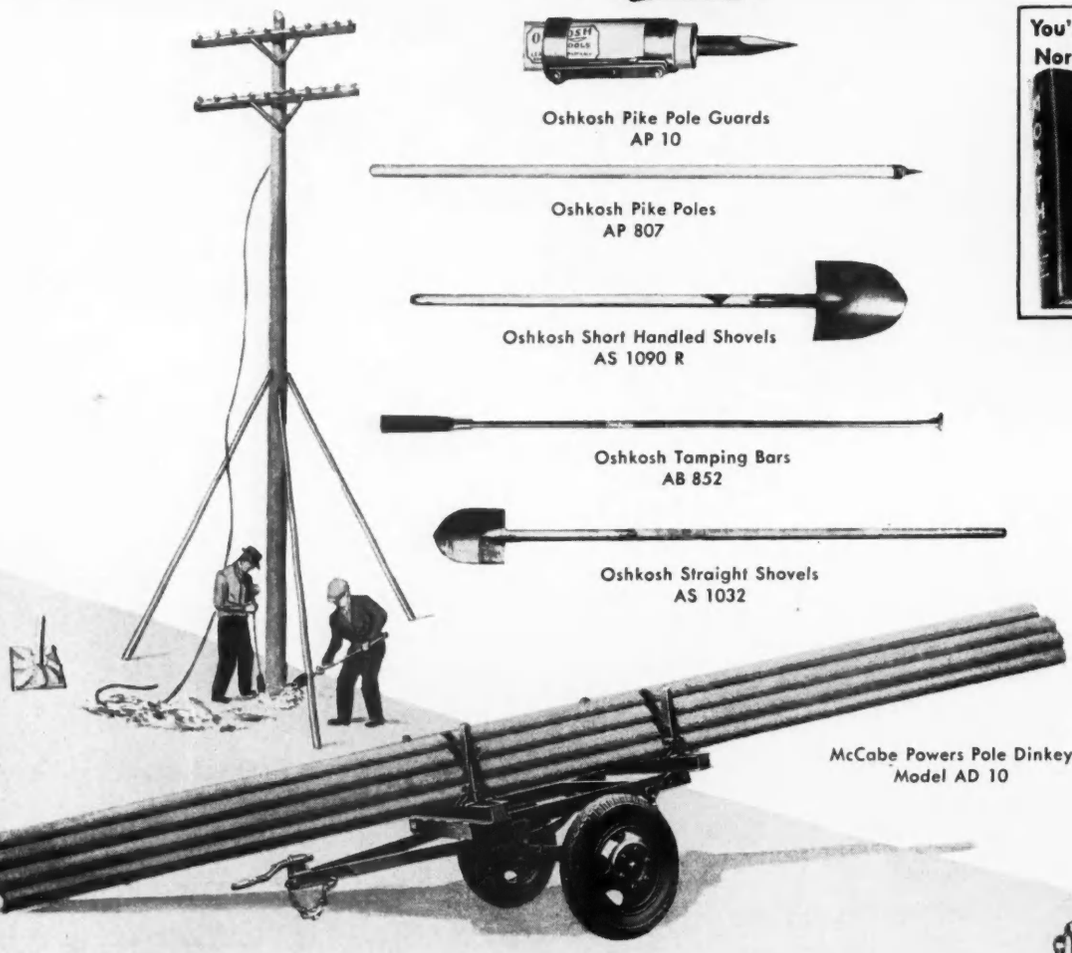
Oshkosh Pike Poles
AP 807

Oshkosh Short Handled Shovels
AS 1090 R

Oshkosh Tamping Bars
AB 852

Oshkosh Straight Shovels
AS 1032

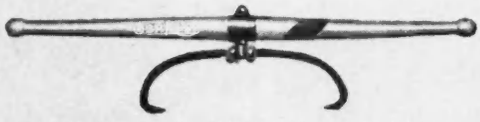




McCabe Powers Pole Dinkey
Model AD 10

Oshkosh
Warning Signs
AE 2

Bartlett Pole Saws
AT 44-4



Oshkosh Carrying Hooks
AC 295

Simplex
Standard
Pole Jacks
AJ 329

Caffing Safety Load Binder
AH A

Klein Swivel
Anchor Hooks
AH 259

Chance Single &
Double Sheave Blocks
AH 2211

Klein Heavy Block Tackles
AH 1802-40

TOOLS and EQUIPMENT

A most important part of your construction planning is careful selection and adequate stocking of all the heavy duty tools you'll need.

You can count on North's long established "know-how" to assist you in the proper selection of large tools that will give you the highest return in quality and continued performance.

Oshkosh Spoons AS 1023
McCabe Powers Series #500 Body
Chance Telescoping Trip Augers AD 610
KaMo Pole Hole Digger
Chance Pole Tongs AC 200 T
Oshkosh Diggers AD 2050

NORTH ELECTRIC COMPANY

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THIS *Nicopress* SLEEVE

plus

THIS *Nicopress* 17-2 TOOL

Make better pair splices faster than you've ever made them before!

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The National Telephone Supply Company

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Export Distributor — INTERNATIONAL STANDARD ELECTRIC CORP., NEW YORK, N. Y.

Nicopress is the Registered Trade Mark of The National Telephone Supply Company

News Briefs

(Continued From Page 18)

project is to get under way immediately, it was pointed out, and, to meet the 1958 completion schedule, it will be necessary to start some of the manufacturing operations "within the next few weeks" at the Western Electric Co.'s Hillside, N. J., shops. The repeaters to be used in the system — 59 in each cable as compared with the 52 in each cable slated for the transatlantic system — will receive the first concentrated manufacturing efforts. They will be produced by Western Electric and will be the same type as used in the transatlantic system.

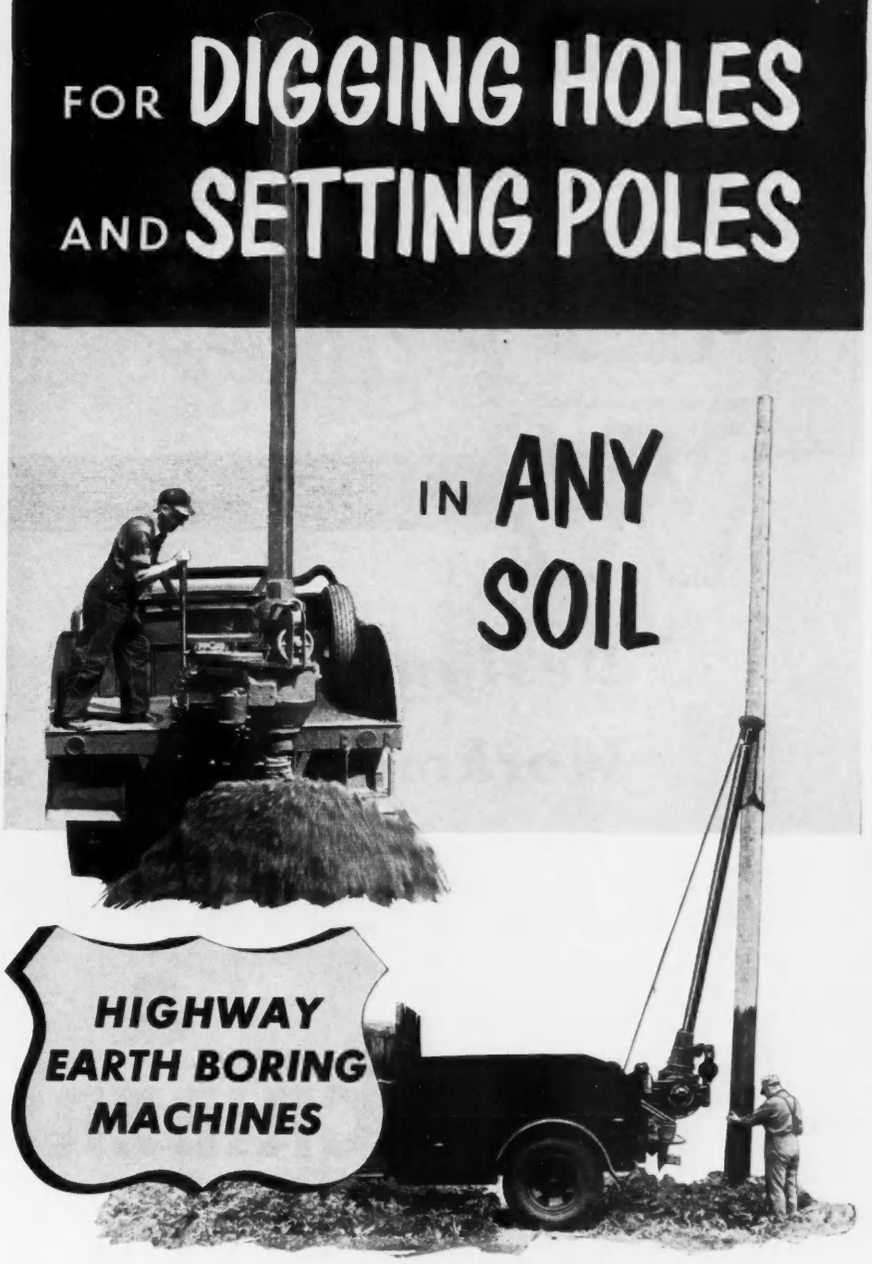
The cables will be landed at Point Reyes, Calif., and Koko Head, Oahu, in Hawaii. AT&T said it is contemplated that the cable system will be owned, operated and maintained by it, but that the Hawaiian Telephone Co. "may acquire an interest in the ownership and operation of the system, subject to the approval of the Commission to be applied for at the appropriate time." In addition to message telephone service, it was indicated, the system will be used to provide "various private line services, including telephone and telegraph." AT&T pointed out that the existing 12 radiotelephone circuits are operating at "substantially full capacity, leaving little margin to provide for future increase in demand."

The radio circuits handled 148,500 messages in 1954. By 1965, AT&T estimated, 29 long distance message telephone, three private line telephone, and six private line telegraph circuits will be needed — not counting military requirements. The new cable will be capable of providing 36 two-way telephone circuits, one of which will be used for the operation of 18 voice frequency carrier telegraph circuits.

Hurricane "Connie" Hits Carolina Tel. & Tel. Company

On August 12, 14 of Carolina Telephone & Telegraph Co.'s 110 exchanges, primarily those located in coastal areas of eastern North Carolina, were isolated from long distance telephone communications to and from the outside world while a limited number of long distance circuits in other areas of the company's 41-

FOR DIGGING HOLES AND SETTING POLES IN ANY SOIL



HIGHWAY EARTH BORING MACHINES

Whether it's in clay, shale, or frozen ground . . . the Highway Earth Boring Machine is rugged enough to dig holes 9" to 20" in diameter, 7' to 10' deep in any soil except solid rock.

Light enough to mount on a 1½-ton truck, these boring machines need only 6' of platform space. Quickly adjusted to dig at any angle. Include an integral winch and pole derrick that will set 40- to 45-foot poles, weighing 2,000 to 2,500 pounds. Can be mounted on either truck or tractor.

See your Highway representative for details or call or write for complete information and specifications.

HIGHWAY TRAILERS

HIGHWAY TRAILER COMPANY

HEADQUARTERS: EDGERTON, WISCONSIN

MANUFACTURERS OF:

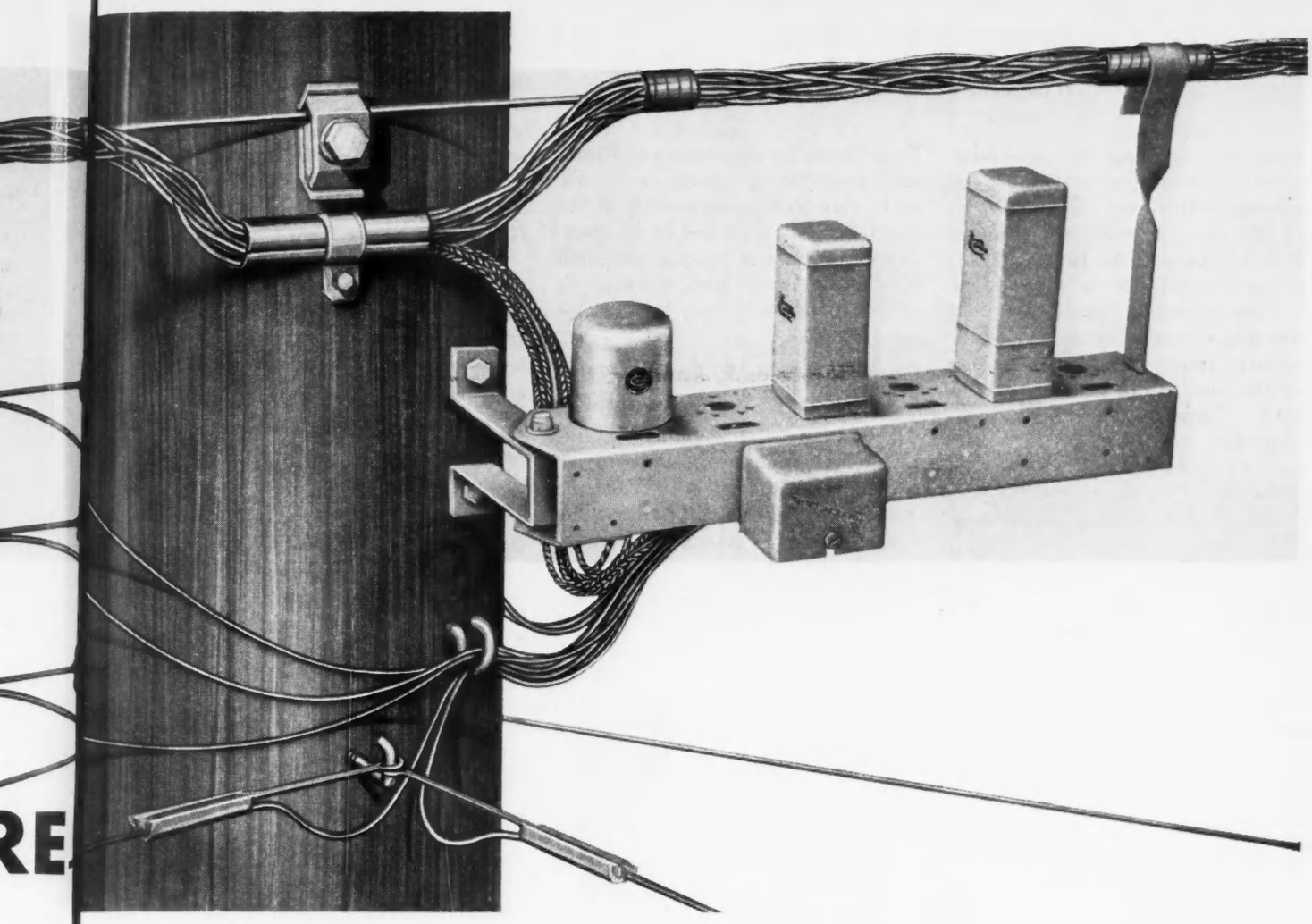
Public Utility Bodies • Earth Boring Machines • Pole and Cable Reel Trailers • Winches • Power Take-Offs • Service Accessories

Designed especially for the workmanlike installation of

RURAL DISTRIBUTION WIRE & SUBSCRIBER DROPS

The "OFF THE POLE" Aluminum Chassis provides an ideal method for messenger mounting of:

Testerms for single party drops
Four Party Junction for 4 party line drops
Interceptor for selective protection
Type 1 High Potential Lightning Arrester
Hy Cap Single Circuit Power Cross Protector
Type 07, 09, 012 or 044 Substation Protectors



These items may now be used in any combination and in strict accordance with the best Handbook Practice as the specific requirements at each pole dictate.

The use of the new RDW Chassis also provides an economical means of using the above Cook products already carried in stock or on the truck. The installation cost is therefore limited to the pairs in use.

Simple to install and easy to wire. The hinged mounting bracket permits the chassis to turn at right angles to the messenger for the lineman's convenience. Drop wires are neatly dressed under the chassis and supported by Stainless Steel Loops. The RDW Chassis is furnished ready for pole mounting with all perforations made to accommodate any of the equipment listed above in any of the eighteen positions. The Chassis is locked to the messenger in the "OFF THE POLE" position with self-adjusting link.

There is no necessity, therefore, to "Haywire" your Rural Distribution. Install the new "RDW Chassis by Cook" and modernize your outside plant.

INDEPENDENT

COOK ELECTRIC Company

Since 1897

2700 SOUTHPORT AVENUE CHICAGO 14, ILLINOIS

Industry News Briefs

(Continued From Page 23)

county territory were out of service due to high winds and water that accompanied hurricane "Connie."

E. M. Friar, general plant manager of the company at its Tarboro headquarters, stated that in areas other than the isolated exchanges, the company had a number of breaks in long distance circuits considerably reducing the number of circuits between points. Long distance services in other than the isolated areas, however, were maintained without too much delay.

It appears that damage to the company's property by hurricane "Connie" will be much less than that caused by "Hazel" last October, primarily because of the different routes taken by the two hurricanes.

Stanford Hoff Chairman, Maryland Commission

GOVERNOR MCKELDEN of Maryland has completed the reorganization of the Public Service Commission with the appointments of a new chairman, general counsel and people's counsel.

State Senator Stanford Hoff, who has served in the state legislature, was appointed chairman of the commission, succeeding John H. Hessy. Leon H. A. Pierson, a leading Baltimore attorney, was named general counsel, and Wilfred T. McQuaid, also a Baltimore attorney, was appointed people's counsel.

Clifford Schafer Joins Home Tel. & Tel. Co.

CLIFFORD E. SCHAFER, secretary and auditor, Citizens Independent Telephone Co., Terre Haute, Ind., recently resigned his position to accept a similar position with The Home Telephone & Telegraph Co., Fort Wayne, Ind. Mr. Schafer had been associated with Citizens Independent Telephone Co. for the past 31 years.

Robert Mutch, a native of Jacksonville, Ill., succeeds Mr. Schafer as secretary of the company. Mr. Mutch comes to the Citizens company from the Blue Mountain Telephone & Telegraph Co., Bangor, Pa., where he served as assistant secretary and auditor.

Mr. Schafer was invited back to Terre Haute for the evening of Thursday, June 23, to attend a dinner party (*see front cover photo*) at the Hotel Deming, arranged by his associates in his honor. He was presented with an engraved, gold wrist watch as an expression of their high regard for him.

General Carlos P. Romulo To Address U-S-I-T-A Convention

ONE OF THE outstanding features of the 58th annual convention of the United States Independent Telephone Association will be an address by General Carlos P. Romulo on the subject "Today's World — Tomorrow's Goals."

One of the most dramatic orators of our time, General Carlos P. Romulo has fought both with arms and

GENERAL CARLOS P. ROMULO

with words in the cause of world peace. He is a brilliant statesman whose eloquent voice has long been a dominant one at many world congresses. His achievements as first Philippine Ambassador to the United Nations and as President at the Fourth General Assembly of the UN have left an indelible impression on world diplomacy. His accomplishments as his country's Ambassador to the United States have been equally distinguished.

Famed for a courageous war record as aide-de-camp to General Douglas MacArthur during the dark days of Bataan, General Romulo has been the recipient of innumerable military decorations for personal heroism. A valiant spokesman for peace, he has been showered with awards and honors by leading world organizations. A Pultizer Prize-winning journalist, he is also the author of such best-selling books as "I Saw the Fall of the Philippines," "Brother Americans" and "I See the Philippines Rise."

Known the world over for his long and honorable service to humanity, General Carlos Romulo is an orator without peer in the unremitting crusade for world understanding.

S.W. Bell Seeks Authority To Purchase Allen Texas Co.

A BELL SYSTEM company last month sought permission to buy an Independent, but in two other instances Bell companies proposed to sell properties to Independents in a better position to operate them.

Pointing out that facilities of the company to be acquired are in poor condition, and that plant is not available to meet service demands, the Southwestern Bell Telephone Co. asked the FCC for approval to purchase the Allen (Tex.) Telephone Co.

The Allen company, located near Dallas, serves 156 telephones. Southwestern Bell would pay $14,000 for the property. The Bell company's property virtually surrounds the Allen firm's territory.

Southwestern Bell, at the same time, asked the FCC for permission to discontinue operation at Isabel, Sawyer, and Nashville, Kans., where it operates 445 telephones. The properties would be sold to the Haviland (Kans.) Telephone Co., which has completed a dial conversion program in two of its nearby exchanges and hopes to integrate the properties into a cohesive unit of all-dial exchanges. The Southwestern Bell exchanges involved are now magneto operated.

The Bell Telephone Co. of Pennsylvania, meanwhile, asked the Commission for authority to discontinue its service at Eagles Mere, Pa., under an arrangement in which it will sell the property to the Commonwealth Telephone Co. Bell of Pa. had 188 stations at the resort community last December, but during the summer has as many as 656. The property, operated on a magneto basis, is entirely surrounded by Commonwealth territory. Application has been made to the Pennsylvania Public Utility Commission for approval of the transaction.

REYNOLDS ALUMINUM OUTDOOR TELEPHONE BOOTHS

Service!

Here at last are the outdoor telephone booths that offer your customers the last word in service and convenience—and serve *you* better, too. They're made of Reynolds Aluminum. They can't rust, can't rot or warp, and are far more economical to maintain. Parts and glass are simply replaced. And—because they're made of lightweight aluminum—they're far easier to handle. It all results in longer booth life, less maintenance, *better service* all around.

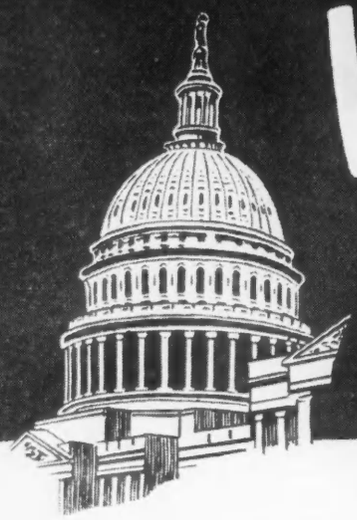
Satisfaction!

Paystation customers appreciate the extra convenience of Reynolds Aluminum Outdoor Telephone Booths. And there are good reasons for it, too. These good-looking, functional booths are more comfortable because they have more room—plenty of ventilation—and, at the same time, ample protection from the weather. They like the large shelf for packages, too . . . *plus* the better visibility. It all pays off in customer satisfaction—a really important advantage for you.

Sell!

Here are the outdoor booths that pay their own way and more in added paystation revenue. They increase business because they invite it—out in the open where they're easy to see, easiest to use. And here's something else! Reynolds Aluminum Outdoor Telephone Booths truly add bonus revenue—without reducing the number of calls from existing indoor paystations. Actual installations at the same location as existing indoor facilities prove it! Put them to work for you. Write today for full information and the name of your nearest distributor. Reynolds Metals Company, 2000 S. Ninth Street, Louisville 1, Kentucky.

REYNOLDS ALUMINUM FABRICATING SERVICE



Washington BUREAU REPORTS

By The Editors of "Telecommunications Reports"

FCC RECEIVES complaints from four companies on Hawaiian cable proposal . . . REA reports $512,267 in interest and principal overdue for more than 30 days . . . Through July 31, REA had allocated $146,355,195 to telephone co-ops, and $93,742,350 to commercial telephone companies.

THE COMPLEXITIES of modern communications service, offering some more evidence that there are easier jobs than being a member of the Federal Communications Commission, are again illustrated in a matter now before the Commission involving an Independent telephone company and a good share of other common carriers regulated by the FCC.

It all began when the American Telephone & Telegraph Co. and the Hawaiian Telephone Co., after long study of plans, engineering data, and similar material, filed with the FCC for authority to build and land on the respective coasts a $35,000,000 submarine telephone cable between the US mainland and Hawaii.

The new cable would be of design similar to the transatlantic telephone cable now being laid, and would become the longest single underwater telephone link in the world. The 2000-mile span of the Atlantic system between Scotland and Newfoundland would be topped by 100 miles, although the overall transatlantic system, including another 300-mile cable between Newfoundland and Nova Scotia, is longer.

At any rate, AT&T pointed out in its application to the Commission that in addition to message telephone service, the system will be used to provide "various private line services, including telephone and telegraph." It was estimated that communications requirements over the route go up to 29 long-distance message telephone, three private line telephone, and six private line telegraph circuits in 1965 — not including military telephone and telegraph needs.

The next thing observers knew, no less than four companies — Western Union Telegraph Co., RCA Communications, American Cable & Radio Corp., and Globe Wireless — had registered with the FCC their complaints or reservations about the proposed new telephone cable.

This is not to indicate, however, that the comments by the international telegraph companies came as a surprise. RCA now operates the radio-telephone transmitting-receiving station in Hawaii, over which all mainland-Hawaii telephone calls are handled until they reach Hawaiian Telephone landlines connected with the station. RCA assumes that a great many of the calls now handled over the radio circuits will go by cable when the new facilities are put into operation, in 1958 under present plans.

Telephone service is not a consideration to the other telegraph companies, but telegraph traffic is, and that includes private line services. Unlike other utilities, international telegraph carriers must compete intensively with other telegraph companies, as well as all other media of communication. Their earnings records have been spotty, and all in all they have little burning desire to see any new starters in the race for telegraph business.

A fine point arises, of course, as to whether US-Hawaii service can legitimately be called "international." It isn't, of course, but falls under that general heading insofar as telegraph practices and regulation are concerned.

RCA Communications President T. H. Mitchell, in his letter to the FCC, said that "The proposed cable would add approximately $6,000,000 to the annual revenue requirements in connection with furnishing communications service between the continental United States and Hawaii. If this amount is saddled on the users of telephone service between these two points, existing rates would have to be trebled and quadrupled. If not saddled on these users, a serious question arises where other telephone users should be forced to underwrite this heavy burden.

"In the light of the overall excellence of existing comprehensive telegraph and telephone services over this particular (radio) path, it is clear that the public interest will not be served by the proposed enormous investment in a facility which is subject to unpredictable interruptions of varying duration due to cable breaks, which can be caused by an enemy.

"In view of the possible damaging effects of the proposed $35,000,000 investment upon the using public as well as upon the services of existing carriers, we believe it is incumbent upon the Commission to explore fully, in public hearings, all aspects of the instant application and to determine specifically whether the present or future public convenience and

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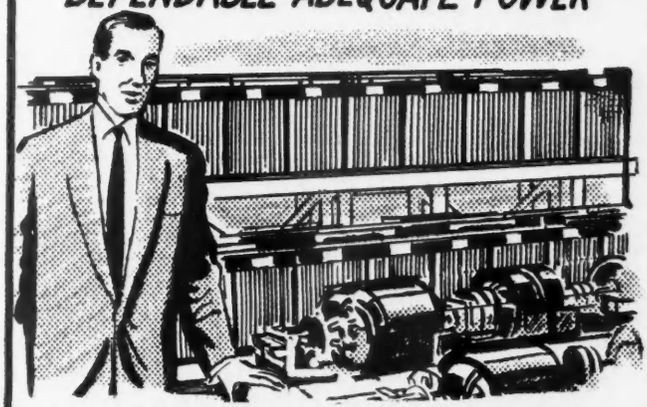
MANCHEX® TELEPHONE BATTERIES

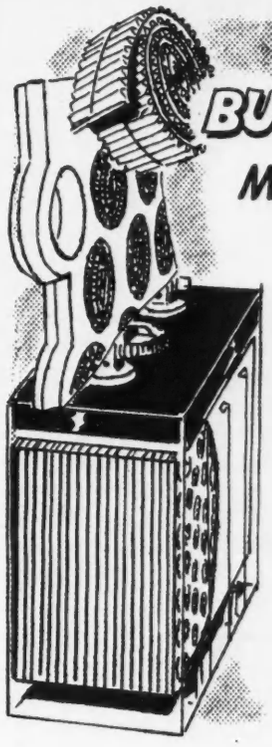
MICROWAVE DEPENDABILITY ...ASSURED BY DEPENDABLE EXIDES!

ENSURING CONTINUITY OF SERVICE, GUARANTEEING OPERATION OF EQUIPMENT INSIDE MICROWAVE RELAY TOWERS ARE THOUSANDS OF EXIDE BATTERIES. THEY FURNISH INSTANT, AMPLE POWER FOR MANY EMERGENCY NEEDS—DO IT WITH LOW OPERATING, DEPRECIATION AND MAINTENANCE COSTS. EXIDES ARE ALWAYS YOUR BEST BATTERY BUY—*FOR ALL TELEPHONE SERVICES!*

"GOOD SERVICE STARTS WITH DEPENDABLE ADEQUATE POWER"



A USER OF EXIDES—ALWAYS DEPENDABLE BATTERIES—SAID THAT RECENTLY. THE "POWER ROOM" OF THIS INDEPENDENT TELEPHONE COMPANY ENGINEER IS PLANNED TO ASSURE SERVICE CONTINUITY UNDER PRESENT LOAD CONDITIONS AND DURING FUTURE GROWTH. EXIDE MAKES A COMPLETE LINE OF TELEPHONE BATTERIES—IN BOTH GLASS AND PLASTIC...BACKS THEM ALL WITH YEARS OF CONSTRUCTION SKILL AND ENGINEERING RESEARCH.



BUTTONS OF LEAD MEAN LESS COST FOR YOU

THE IMPROVED PLANTĒ TYPE POSITIVE PLATES OF THE EXIDE-MANCHEX BATTERY ARE OF THE MANCHESTER DESIGN—AN EXCLUSIVE EXIDE FEATURE. BUTTONS OF LEAD DELIVER THE POWER YOU NEED, WHEN YOU NEED IT. OVER A HALF CENTURY OF DEPENDABLE PERFORMANCE IN TELEPHONE BATTERY SERVICE HAS DEMONSTRATED THAT EXIDE BATTERIES WITH THEIR BUTTONS OF POWER ARE YOUR BEST POWER BUY—*AT ANY PRICE!*

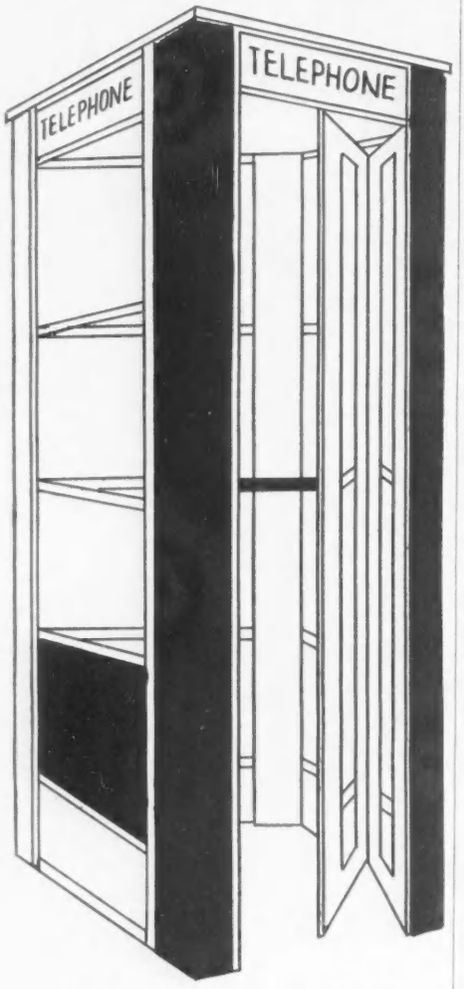
LET EXIDE HELP SOLVE YOUR TELEPHONE BATTERY PROBLEMS. ❶ CALL AN EXIDE SALES ENGINEER FOR FULL DETAILS. ❷ WRITE FOR FORM 4993, A TELEPHONE BATTERY ENGINEERING AND MAINTENANCE MANUAL.

Exide INDUSTRIAL DIVISION, The Electric Storage Battery Company, Philadelphia 2, Pa.

Indoors or Outdoors . . . .

COIN BOXES ARE BUSIER IN WYNNCO

TRAFFIC POINT BOOTHS



Lifetime anodied aluminum in choice of vivid color, or natural finish.
Stronger, lighter; economical because less maintenance, lower shipping costs.
***Shipped assembled* with line and power entrances, lights, safety glass panels, door closer, directory shelf, illuminated signs, etc.**
More comfortable because larger (33½x33½x85) and with fiber glass insulated roof.

Write or phone today for complete specifications.

WYNNCO
PRODUCTS CORP.
344 Luckie Street, N.W.
Atlanta, Ga. Lamar 1341

"Thirty years ago I was a poor boy. Now, thanks to high income taxes, I'm a poor man!"

necessity require the proposed cable."

Western Union President Walter P. Marshall declared that it is "Western Union's position that AT&T's use of the proposed cable should be limited to the voice telephone field and that AT&T should be required, incident to approval of its application, to make available to the record communications carriers the necessary facilities to meet all record communications requirements, including telegraph, private line telegraph, TWX, and facsimile services, between the mainland and Hawaii."

American Cable & Radio recalled its position, taken when AT&T filed with the FCC for the radio relay system between Portland, Me., and the Canadian border, connecting with the transatlantic cable, that the link should be used for telephone services only. The FCC went along with the telegraph companies and imposed such a restriction on the permits for the radio relay system (the only part of the transatlantic cable system requiring FCC approval). AC&R said that it is "naturally" interested in any telegraph service which may be provided over the proposed mainland-Hawaii cable.

Globe Wireless said it has no objection to a telephone-only cable, but is very much against one which also handles telegraph services. If, it said, the Commission must authorize a cable which would have telegraph as well as telephone purposes, it hopes that the provision of telegraph service will be left to telegraph companies.

The Commission is expected to take some kind of action on the proposed telephone cable in the near future, although it may be only to set the case down for hearing.

REA Reports On Overdue Payments

THE TELEPHONE industry's frequently-made point that it has greater risk than some other utility operations, such as electric power, was exemplified in the Rural Electrification Administration's monthly statistical bulletin, showing a fairly substantial amount of borrowers' payments overdue for more than a month.

In the bulletin, for the period ended June 30, REA reported a total of $512,267 in interest and principal overdue for more than 30 days, with more than two-thirds of the total due from cooperatives. All borrowers have paid a total of $2,159,919 on interest and principal since the start of the farm telephone program, up through June 30.

REA's electrification program is well-known for its low rate of loan payment delinquencies, but its officials have pointed from time to time to the greater degree of risk in providing farm telephone service.

Although REA had 181 commercial company borrowers to 177 co-op borrowers as of July 31, $146,355,192 had been allocated to co-ops and $93,742,350 had been allocated to commercial companies. Co-ops had been advanced the sum of $63,330,017 at the close of July, while commercial companies had received $39,477,021.

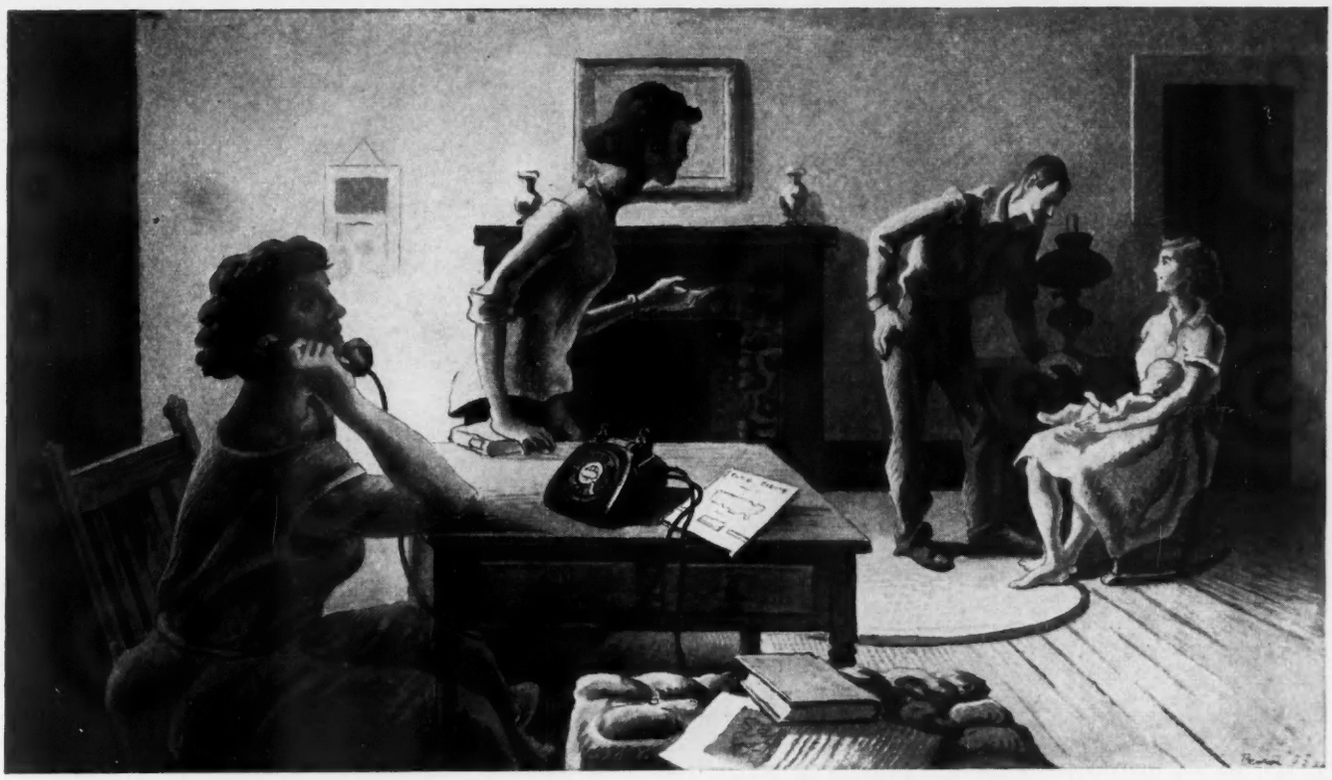
The report showed 160 applications on hand at the agency on July 31, for a total of $51,130,769.—***The End.***

UNITED UTILITIES, INCORPORATED

42nd Consecutive Dividend

The Board of Directors declared a quarterly dividend of 30 cents per share on the outstanding common capital stock of the company, payable on or before September 30, 1955, to stockholders of record at the close of business September 6, 1955.

Abilene, Kansas **ALDEN L. HART.**
August 23, 1955 **President.**



FAMILY COUNCIL

BY Thomas Hart Benton

The telephone brings even far-off members of the family to the council table in voice at least.

Toll calls are an increasingly important source of revenue to telephone companies. Does your directory contain adequate instructions for placing of long-distance calls? Or do your operators spend too much time explaining the procedure to subscribers who use the long lines?

Tried-and-proved long distance information is only one of the many advantages of retaining Loomis' complete telephone directory service.

There are many other ways to build an accurate directory—more useful for your subscribers . . . a more powerful medium for your Yellow Page advertisers . . . and more productive in net revenue for your stockholders, your employees and yourself.

You owe it to yourself to find out the full details of Loomis' complete directory service for increasing advertising revenue and building public relations. There's no obligation on your part when you write or call the Loomis office nearest you.

LOOMIS

ADVERTISING COMPANY

Over 772 cities and towns in 20 States are served by 250 Loomis-built directories.

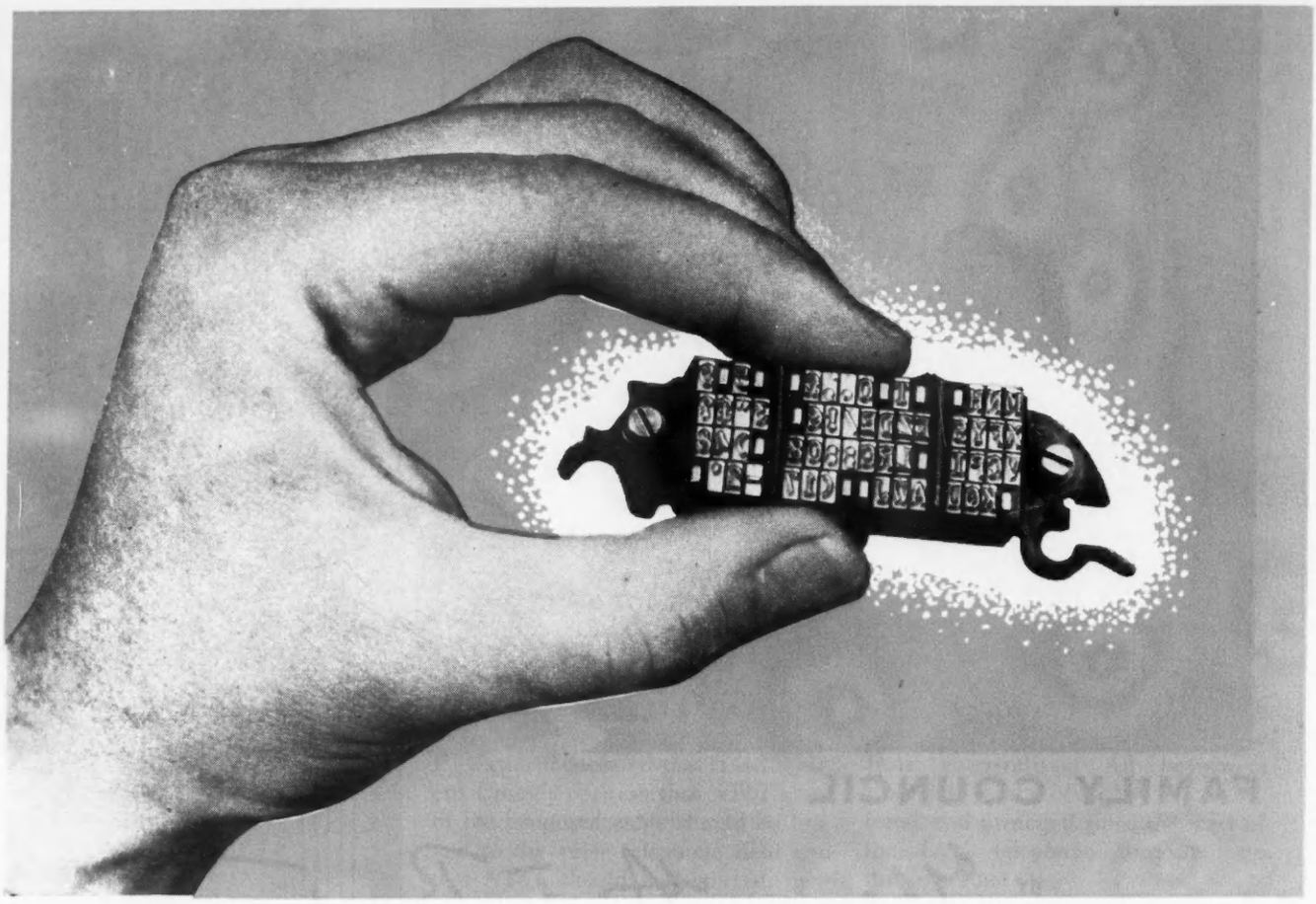
We have commissioned Mr. Benton to draw four scenes of American Life. A limited edition of 9 x 15-inch prints suitable for framing has been ordered. We think they offer a nice public relations touch to your telephone office decoration. To get your Benton print FREE, write Wesley H. Loomis III, 810 Baltimore, Kansas City, Mo.

LIFTS YELLOW PAGE REVENUE . . . BUILDS PUBLIC RELATIONS

"Where to Call"

KANSAS CITY
810 Baltimore
HArrison 1270

FORT WAYNE
229 E. Berry St.
EAstbrook 3477

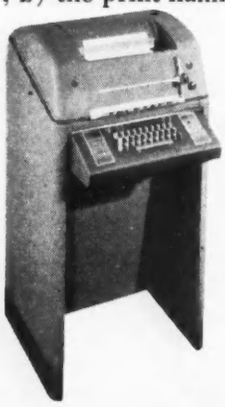


The tiny Typebox that holds big ideas for printing telegraphy

The new Teletype 28 Page Printer is so completely original in concept that it introduces many revolutionary ideas to the field of printing telegraphy. Perhaps the most ingenious of these is that you don't need a conventional typebasket and heavy carriage.

A featherweight carriage featuring a two-ounce Typebox replaces it in the Teletype 28. Here's how it works: a) the Typebox is moved to bring the selected character to the fixed printing position; b) the print hammer drives the type pallet against the ribbon and paper; c) after each stroke the Typebox is returned to its unoperated position below the printed line. Shift and unshift are governed by the Typebox position. The platen remains stationary.

You can easily see the advantages: smooth, quiet operation at 60, 75, or 100 wpm; maintenance cut materially; quick interchangeability in type faces (without tools) making for remarkable flexibility. Altogether, the Teletype 28—with its completely new Typebox — represents a giant stride forward in the art of printing telegraphy.



Teletype 28. *If you would like complete information, write to our new sales and service office: Teletype Corporation, Dept. TEM9, 4100 Fullerton Ave. Chicago 39, Ill.*

TELETYPE

TELETYPE CORPORATION

SUBSIDIARY OF

Western Electric Company

INCORPORATED

Conserve

CIRCUIT TIME
OVERTAXED FACILITIES
OPERATING FORCE

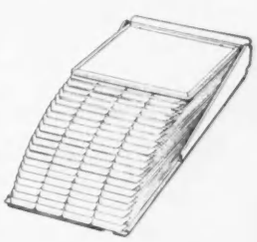
REDUCE COST OF OPERATION • IMPROVE CUSTOMER SERVICE

with

ACME VISIBLE

MULTI-CARD BULLETIN HOLDERS for Long Distance Inter-Toll Dialing

One operator with her individual Routing Multi-Card file, containing over 95% of the routes for originating traffic, can do the job faster and more efficiently.—No need to bring in a second operator.—No guess work; routes are before her—*visible.*—Calls are completed quicker.—By this method of centralized provision of Routing records, more routes are available to the Central Office force. Consequently less "121" calls go over the LD circuits. With the use of the Acme Visible Multi-Card Bulletin Holders, each operator is able to determine over 95% of her routings and rates. Operator can immediately compute charges on Coin Box calls or where there has been a request for T & C. By not trunking to Rate & Route operator, less operator time is needed at these positions.



3 SIZES • 9 CAPACITIES

Acme Multi-Bulletin holders are carried in stock in 3 sizes—with 10, 15 or 20 hangers. Each unit is available with 2, 3 or 4 pockets per hanger to provide a wide range of capacities for listing towns frequently called—from 720 to 2,880 listings using 6 lines to the inch and from 960 to 3,840 listings using 8 lines to the inch. They are supplied with Acme Visible Cellulose acetate pockets 5¼" wide x 4⅜", with slant-cut index tabs. Card inserts are 5¼" wide x 3½". Inserts are used in both front and back of pockets. Available for immediate shipment; you may order one or as many as you need at a time. Units are supplied complete with insert cards and labels for index tabs.

ACME VISIBLE RECORDS, INC. CROZET, VIRGINIA

District Offices and Representatives in Principal Cities

ACME VISIBLE RECORDS, INC., Telephone System Division, Crozet, Virginia

Please send us illustrated booklet

☐ #994 on Acme Multi-Card Bulletin Holders ☐ #982 on Acme Flexoline for Telephone Companies

☐ Have representative call. Date..... Time.....

☐ We are interested in Acme Visible equipment for ..... records.
KIND OF RECORD

Company..... Attention.....

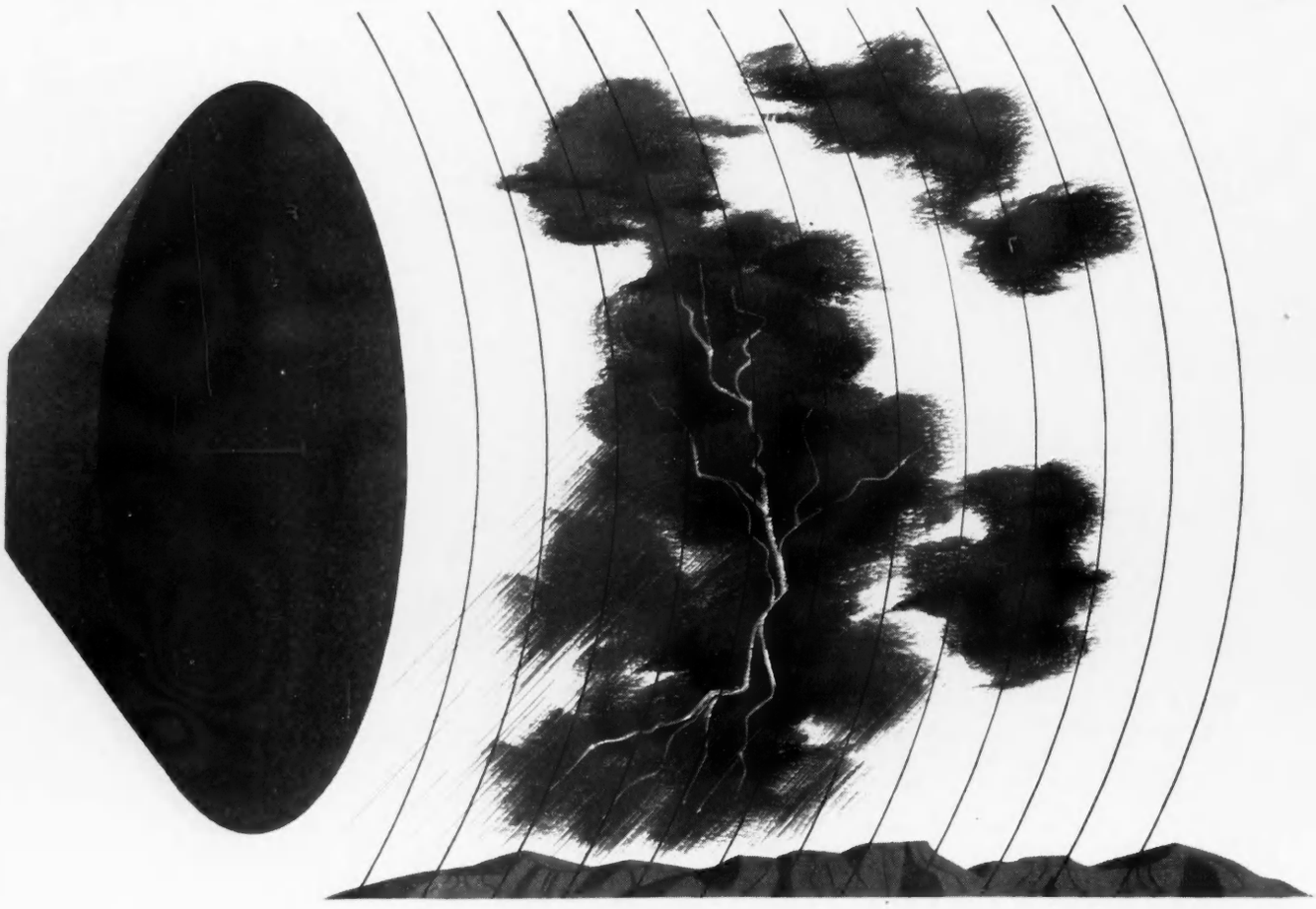
Address.....

City..... Zone..... State.....

Here are two informative booklets illustrating and describing various units which have been designed for, and use-tested by, telephone companies throughout the country.

Send for your copies today!

99.8% EFFICIENT



Lenkurt Microwave ignores the weather!

"DOWNTIME: Less than 0.2%. OUTAGES DUE TO FADING: None whatsoever. SERVICING NEEDED: Minor repairs (mostly replacements of tubes) handled by the telephone company's own maintenance men".

These figures and facts tell one company's remarkable (but not unusual) story of Lenkurt Microwave's dependability throughout a year of service.

Twenty-four channels of Lenkurt Microwave were set to work, handling the busy traffic over this troublesome terrain. Confidence in this equipment was confirmed as the months went by and outages proved measurable in minutes only—very few minutes, very quickly cleared up by minor, *indoor* maintenance!

Today, on that same stretch the telephone company maintains its physical lines—as stand-by facilities! Day-in, day-out traffic goes over equipment they can be sure of—in any weather!

Investigate *dependable* Lenkurt Microwave today—
the *weatherproof toll line* that can solve
your most troublesome problem!

Call or write Automatic Electric Sales Corporation (HAymarket 1-4300), 1033 West Van Buren Street, Chicago 7, Illinois.
In Canada: Automatic Electric Sales (Canada) Ltd., Toronto.
Offices in principal cities.

Low Initial Cost

Investigate Lenkurt Microwave's low first cost. You'll find it may prove in over physical equipment for distances as short as 13 miles!

Package Engineered

Automatic Electric "Follow-Thru" Engineering eliminates ALL problems in Lenkurt Microwave installation and maintenance.

Easily Serviced

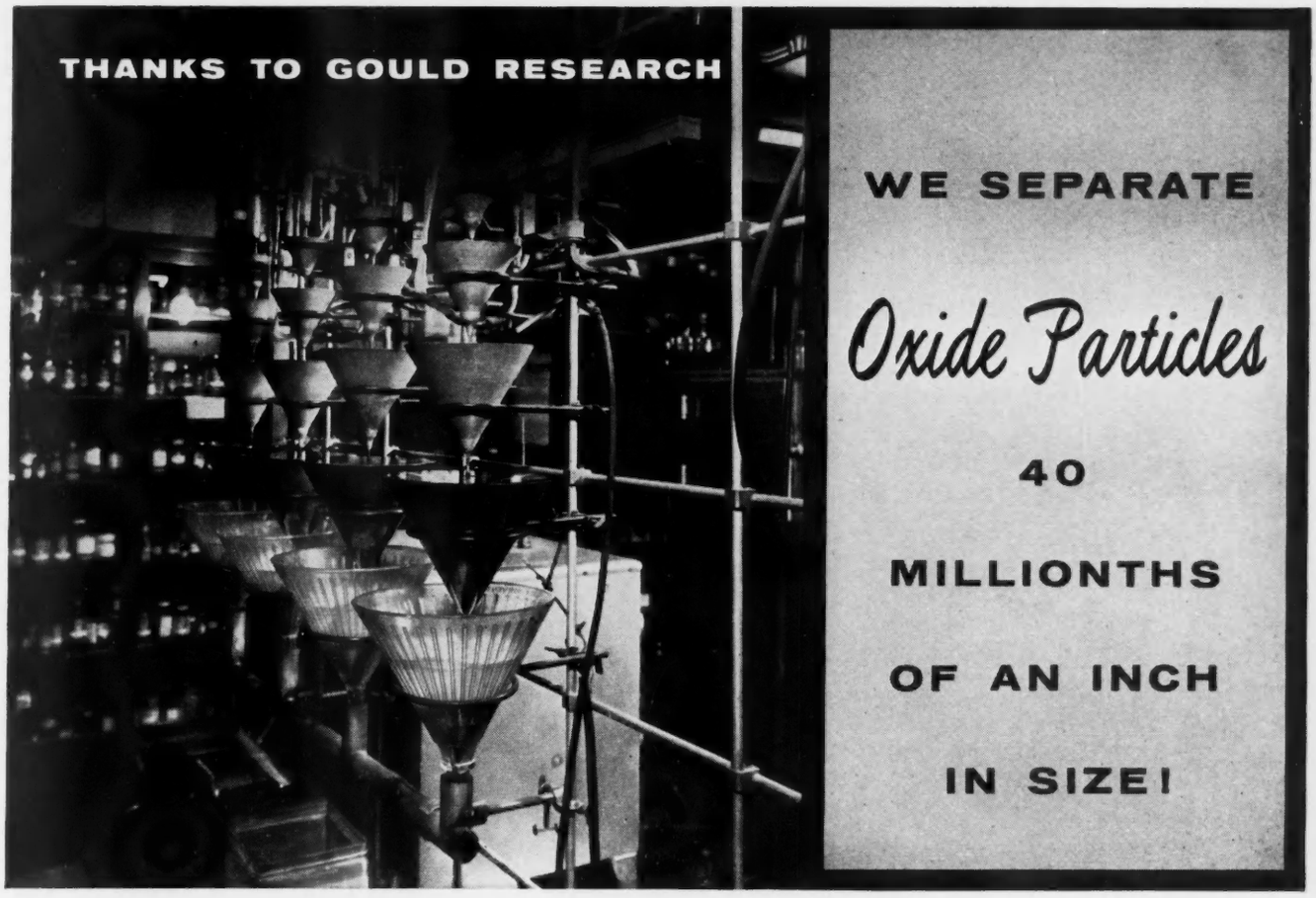
"Follow-Thru" Engineering includes training your personnel in the simple techniques involved in Lenkurt Microwave maintenance and servicing.

Manufactured for

AUTOMATIC ELECTRIC

ORIGINATORS OF THE AUTOMATIC TELEPHONE

AUTOMATIC ELECTRIC—LEADERS IN CARRIER COMMUNICATION—**LENKURT**

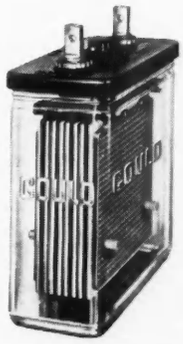


TO GIVE YOU GREATER BATTERY CAPACITY!

Illustrated above is a Thompson Classifier in the Gould Battery Research Laboratory at Depew, N. Y. It is used to separate, by flotation, particles of lead oxide so small that they'll pass through the finest sieve made.

Particle separation is important in achieving uniformity of oxide . . . and battery capacity and life are helped by having each type of oxide fall within a specific particle size range.

This method of particle separation quickly determines which oxides are best for various types of Gould Batteries. Another reason why you get better batteries from Gould through research.



America's Finest!
GOULD PLANTÉ
The Aristocrat of
Stationary Batteries

© 1955 Gould-National Batteries, Inc.

GOULD
Batteries

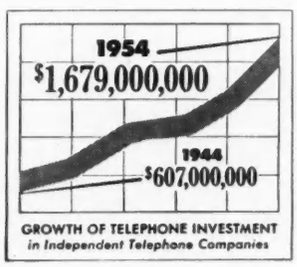
GOULD-NATIONAL BATTERIES, INC.
TRENTON 7, N. J.

"BETTER BATTERIES THROUGH RESEARCH"

Always Use Gould-National Automobile and Truck Batteries

$165,000,000 appetite!

To give our customers all the telephone service they want, fast-growing Independent companies spent $165,000,000—*last year alone*—enlarging and improving telephone facilities! Most of this investment went into products of the telephone industry's several hundred manufacturers and thousands of small suppliers. From these producers, Independent telephone companies get the very best in equipment, tools and materials. Nothing less will satisfy our 11,000 communities... with a need for modern service in ever-increasing amounts!



GROWTH OF TELEPHONE INVESTMENT
in Independent Telephone Companies

Independent Telephone Companies of America

United States Independent Telephone Association • Pennsylvania Building • Washington, D.C.

"That's really a home run . . . almost all the way to the next pole!"

● It will really take that ball a long time to reach the next pole. Because this line is strung with Amertel 135, the next pole is a long way off.

Since it permits longer spans, high-strength Amertel 135 cuts the cost of pole installation and maintenance. You don't have to dig so many holes and you don't have to set so many poles.

Amertel 135 has low electrical resistance and far better voice transmission qualities than BB wire.

For more information, write to American Steel & Wire Division, Rockefeller Building, Cleveland 13, Ohio.

AMERICAN STEEL & WIRE DIVISION, UNITED STATES STEEL
GENERAL OFFICES: CLEVELAND, OHIO

COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO, PACIFIC COAST DISTRIBUTORS
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UNITED STATES STEEL EXPORT COMPANY, NEW YORK

USS Tiger Brand AMERTEL

TELEPHONE & TELEGRAPH WIRE

USS

UNITED STATES STEEL

NOW... CHANCE PIKE POLES ARE LAMINATED!

For greater uniformity... greater rigidity!

Now...Chance Pike Poles are made by bonding together carefully selected Douglas fir boards. Laminated Pike Poles have many advantages over the old, single board pike pole. They're more rigid. They're more uniform. Each board reinforces the other.

SAFETY PIKE — *Point can be reversed as shown in circle, for safety in handling and transporting between jobs.*

PLASTIC PROTECTED

Chance *laminated* Pike Poles are available with tough Maplac plastic coating. Splintering of the wood is eliminated. Lost-time hand injuries, caused by splinters, are avoided.

IT PAYS TO BUY HIGH QUALITY IN A PIKE POLE. Only on a Chance pike pole will you find the steel reinforced butt which protects the end of the pike. And only *laminated* Chance pike poles are available with Maplac protection.

Write for the full story today.

CT55-1A

A·B·CHANCE CO·
CENTRALIA, MISSOURI
SAN FRANCISCO, CALIFORNIA

ACROSS THE EDITOR'S DESK

B. L. Fisher

WE HAD the good fortune to know *B. L. Fisher* whose death saddened the industry last month. Mr. Fisher not only built an Independent telephone company but was long a leader in civic and affairs in his native county and Martinsville, Va., where he had lived since the early 1930s.

Mr. Fisher's interest in the telephone was aroused when no one could tell him how and why the instrument operated. Determined to find out "how and why" he ordered a book which gave him the facts. And from that book grew a remarkable career that established the present Lee Telephone Co. system covering seven counties in Virginia and North Carolina and extending 75 miles west from Danville to the Blue Ridge mountains and 100 miles north to south from Roanoke to Winston-Salem, N. C. His company now services in excess of 19,000 telephones.

As a telephone man, industry leader, friend and counsellor, it was not only the experience and integrity he gave the industry, it was himself and there is none of us that his passing does not sadden.

■ ■ ■

John C. Larkin

INDEPENDENT TELEPHONY lost another of its most ardent, loyal and venerable benefactors when *John C. Larkin* passed away on July 18 at the Clifton Springs Sanitarium in Clifton Springs, N. Y. as a result of a heart attack. A certified public accountant, Mr. Larkin founded an accounting firm, which bears his name, in Syracuse. As a young man, Mr. Larkin, with his excellent ability, was responsible for the formation of many of the Independent telephone companies operating throughout New York today. Through the years, he devoted much of his time and talent to several companies, giving them counsel, guidance and support in matters of financing, organization and operations. He was a frequent visitor at Association functions, most recently at the New York 1955 convention at Scaroon Manor. Shortly after the convention, he entered the Clifton Springs Sanitarium for a check-up and was stricken with the attack to which he succumbed at the age of 73 years. He is survived by his widow, Emily Warner Larkin of Phoenix, N. Y.

■ ■ ■

"The Gopher Circuit"

THE MINNESOTA Telephone Association is to be complimented on its new publication — "The Gopher Circuit." The 4 page publication, a part of the association's new year-round program to familiarize the public with the size and scope of Minnesota's telephone industry, was announced recently.

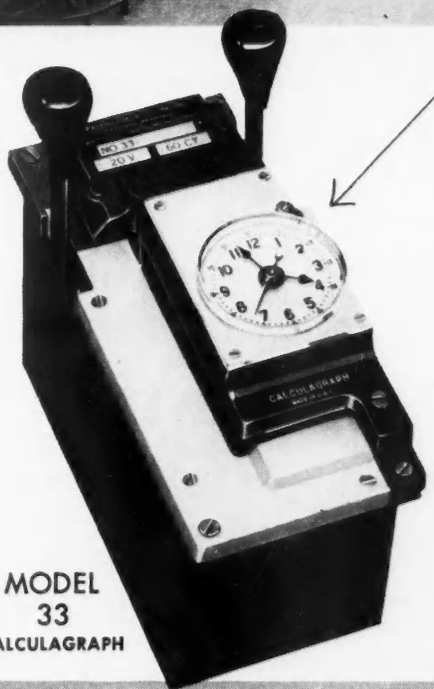
C. F. Marvin, manager of Zumbrota (Minn.) Telephone Co., is chairman of the committee named by the association's board of directors to supervise the program. Other committee members include *George R. Rohe*, manager of Minnesota Community Telephone Co., Waterville; *P. M. Ferguson, Jr.*, manager of Mankato Citizens Telephone Co.; *Wayne Caldwell*, manager of Home Telephone Co., Clarkfield; *A. H. Brown*, commercial manager of Pioneer Telephone System, Waconia; and *Keith W. Vogt*, St. Paul, executive secretary of Minnesota Telephone Association, Inc.

Here's why *modern* exchanges use

CALCULAGRAPH

Photo Courtesy of STROMBERG CARLSON CO. and THE PENINSULAR TELEPHONE CO.

–for QUICK, ACCURATE, AUTOMATIC toll time recording!



MODEL 33 CALCULAGRAPH

Busy exchanges throughout the world are using Calculagraphs because they produce quick, accurate, automatic toll time records. Accurate to-the-second, printed records eliminate switchboard detail work and assure you of collection of all revenue due on every call. **CALCULAGRAPHS** are precision instruments with high visibility clock dials, easy to operate — featuring smooth silent lever action.

For complete information on the various models available write to —

CALCULAGRAPH COMPANY

HARRISON • NEW JERSEY

THE STANDARD OF ACCURACY SINCE 1892

Coming Up!

October 10-11-12

CONRAD HILTON HOTEL – CHICAGO, ILLINOIS

The 1955 Convention of The

UNITED STATES INDEPENDENT TELEPHONE ASSOCIATION

58 Years of Service to the Independent Telephone Industry

A Cordial Invitation is Extended to all INDEPENDENT OPERATING TELEPHONE PEOPLE and THEIR MANUFACTURERS AND SUPPLIERS*

GENERAL SESSIONS

Topics of Outstanding Importance
Excellently Qualified Speakers

CONFERENCES

Plant-Traffic-Commercial-Accounting
Answers to Tomorrow's Questions

INDEPENDENT TELEPHONE PIONEER ASSOCIATION

Annual Business Meeting and Entertainment

U-S-I-T-A *Annual Banquet*

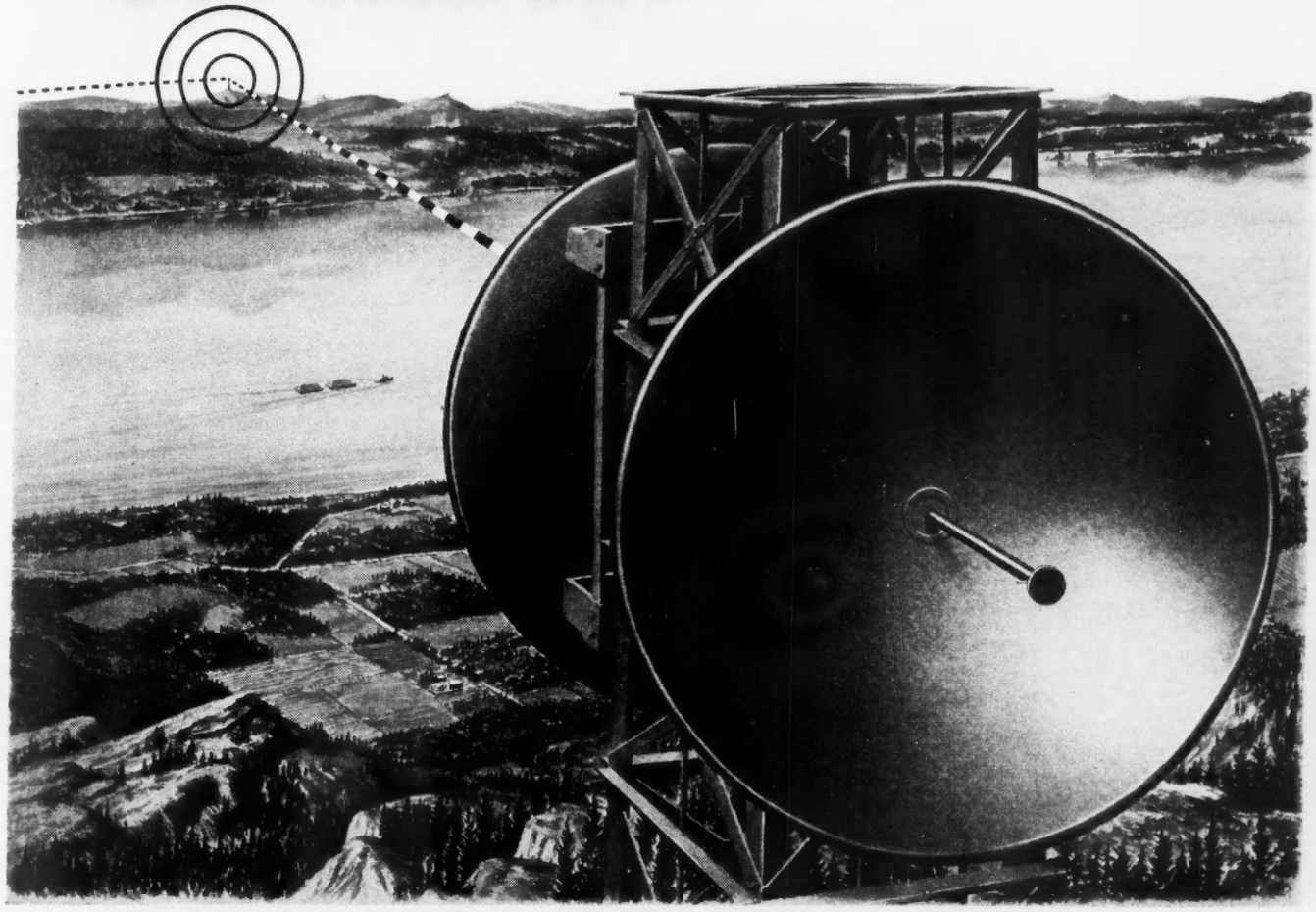
Wonderful Food • Entertainment • Fellowship

United States Independent Telephone Association

Pennsylvania Bldg., Washington 4, D. C.

**Attendance of Manufacturers and Suppliers Limited to Member Companies*

"ON TARGET"



. . . FOR ALL-INCLUSIVE, ALL-WEATHER COMMUNICATIONS THROUGH MICROWAVE

Microwave goes straight to the core of communications problems — with a simple solution! No costly wireline construction or maintenance . . . dish-like antennas beam the microwave signal between line-of-sight points separated by waterways, jungles, forests, or mountainous areas. Transmission is completely reliable, for it is *unaffected by weather*. Simultaneous, multichannel operation easily accommodates the volume and variety of communications so vital to modern business. For example, as many as 19 telegraph circuits can be carried by any *one* of the many telephone channels provided by the ISE system.

Microwave was successfully demonstrated for the first time in 1931 by International Telephone and Telegraph Corporation. Today this system, developed and improved through the years, is made available outside the United States through ISE, associate of IT&T. Would you like the facts on what microwave can mean to *your* communications? ISE engineers will be happy to consult with you.

FACTORIES IN SOUTH AMERICA: Cia Standard Elec. Argentina, S.A. Ind. y Com., Buenos Aires, Argentina • Standard Electrica, S.A., Rio de Janeiro and São Paulo, Brazil, Cia. Standard Electric, S.A.C., Santiago, Chile.

International Standard Electric Corporation

WORLD WIDE EXPORT DISTRIBUTORS

***Export Department*, 50 Church St., New York 7, N. Y., U. S. A.**

ISE — an IT&T associate

Central telephone exchange equipment for installations of any size, automatic or manual.

Cables, wires, conduits, structures—equipment and supplies for every communication and power need.

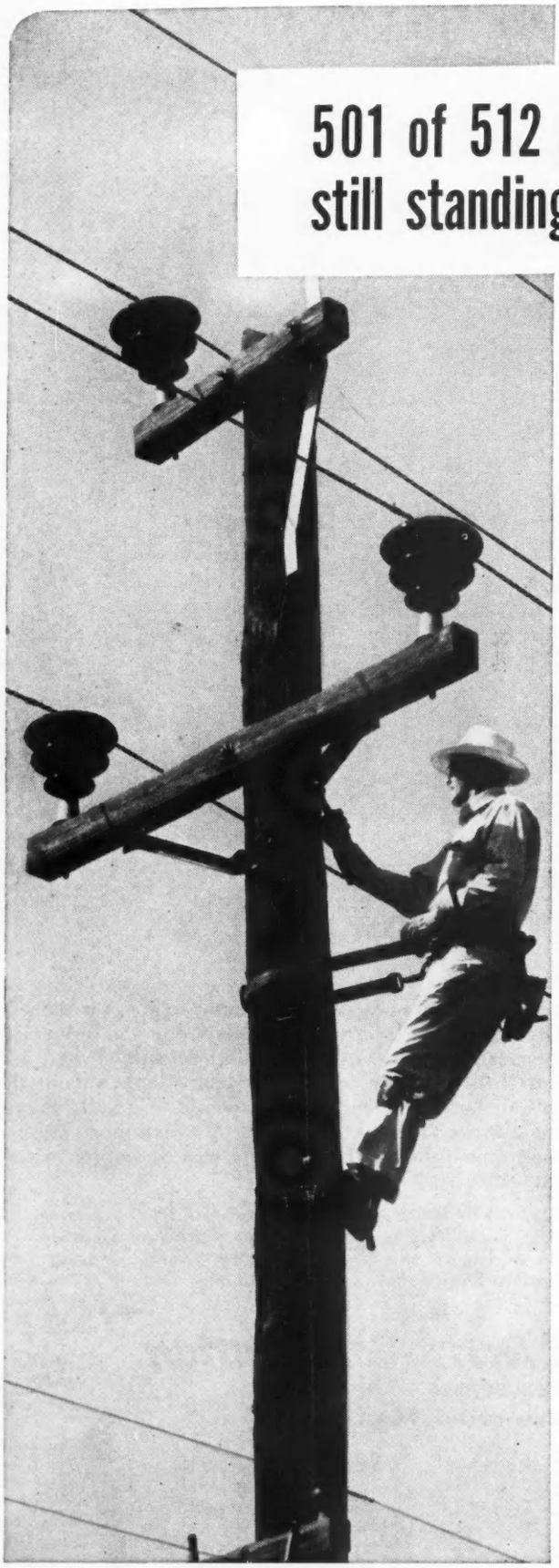
Radio aids to air navigation . . . complete airport communications and lighting systems.

Teleprinters for automatic transmission and reception of written messages.

All equipment for television and radio broadcasting and receiving . . . point-to-point communication.

Here's Proof of Performance...

501 of 512 pressure-creosoted poles still standing in this 27-year-old line



Duke Power Company, Charlotte, N. C. —supplying power to 40% of the nation's textile spindles—has been using pressure-creosoted poles since 1913. Careful records kept by Transmission Engineer M. E. Kimbrell show an extremely low rate of pole failure.

A 17.4-mile transmission line between Elkin and North Wilkesboro, N. C. was erected in 1928 with 512 pressure-creosoted poles. Today, 501 of these poles are still in service in their original locations.

Pressure-creosoted poles which Duke Power Company is obtaining today not only meet the requirements for long life, but high standards of pole cleanliness as well.

Your pressure-treater can supply you with poles that meet these requirements, especially if he uses USS Creosote. It's a uniform preservative, made to give uniformly good results. For complete information, contact our nearest Coal Chemical sales office listed below or write directly to United States Steel Corporation, 525 William Penn Place, Pittsburgh 30, Pa.

. . .

One of the 27-year-old pressure-creosoted poles in Duke Power Company's transmission line between Elkin and North Wilkesboro, N. C.

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Telephone Engineer

EDITORIAL

Telephone Engineer

"Grease The Wheel Before It Squeaks"

WE ARE SURE you have heard the old saying — "*The squeaky wheel gets the grease.*" Translated it means some folks never do anything about things until they have to. Or, to point out a case, take the man with the leaky roof: when it rained he couldn't fix it; when it did not rain there was no need to fix it.

Thanks to today's effective preventive maintenance programs there are fewer squeaky wheels in need of greasing. This is especially true in the telephone industry where preventive maintenance is a year-round program, moving at a regular pace in the Spring and Summer and at a stepped-up pace in the Fall.

We believe this scheduling is as it should be. Especially do we believe in boosting the tempo of preventive maintenance programs during the Fall months — September, October and November.

From what we have seen and heard there is no better time than the Fall months for making sure the outside plant is in good condition. Right now it is a lot *easier*, *pleasanter*, and *cheaper* to locate and repair future trouble makers than it is to fix those weak spots when the mercury is slipping toward the zero mark.

The records of the believers in repairing the weak spots before winter weather sets in prove many things. First off they prove that a plant which has been thoroughly checked and its weak spots corrected has a better chance of withstanding winter weather than the plant that has not received such attention.

That fact alone makes Fall preventive maintenance programs rate high in the minds of many telephone men. But there is another good reason for the high rating. Briefly it has to do with costs.

Costs, as all industry members know, are so high today that even a minor plant repair job completed under the most favorable circumstances is an expensive undertaking. Yet, the same job done on an emergency basis when costs must be forgotten in favor of prompt service restoration measures takes an even deeper bite out of net earnings.

That may well be the prime reason for the importance of the Fall preventive maintenance projects. For it seems to us that preventive maintenance — especially that performed during the Fall months — is one of the few ways left in this era of high costs by which a telephone company can economize and at the same time improve its service.

Basically the Fall preventive maintenance program is a type of insurance against far greater costs and inconvenience to both company and subscriber.

Of course, even the best job of preventive maintenance cannot prevent all winter plant trouble. But at least it will eliminate a considerable number of breaks and troubles which are twice as bad to deal with in winter and cost twice as much.

It will also prevent many interruptions in service at a season when such interruptions are much more bothersome to the subscriber than at any other time of the year.

With such benefits in mind, it seems to us that right now while the sun is riding high and still has some warmth in its rays there is no better time to do as we said in the title of this editorial: — *Check the wheels and apply the grease before the squeaks develop.*

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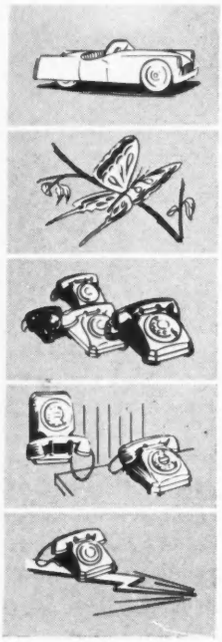

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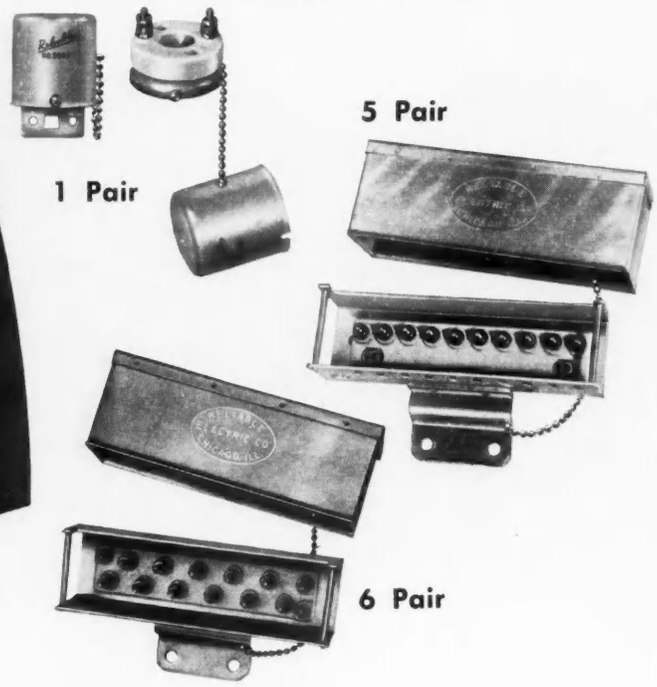

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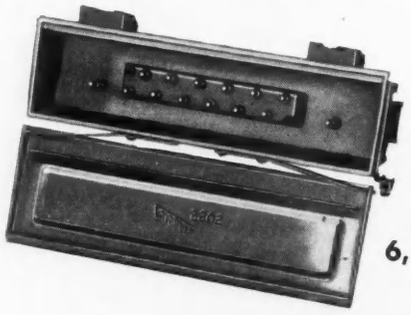
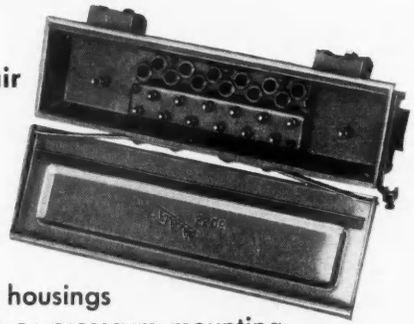


Unprotected
6, 11 and 16 Pair

Protected
6, 11 and 16 Pair



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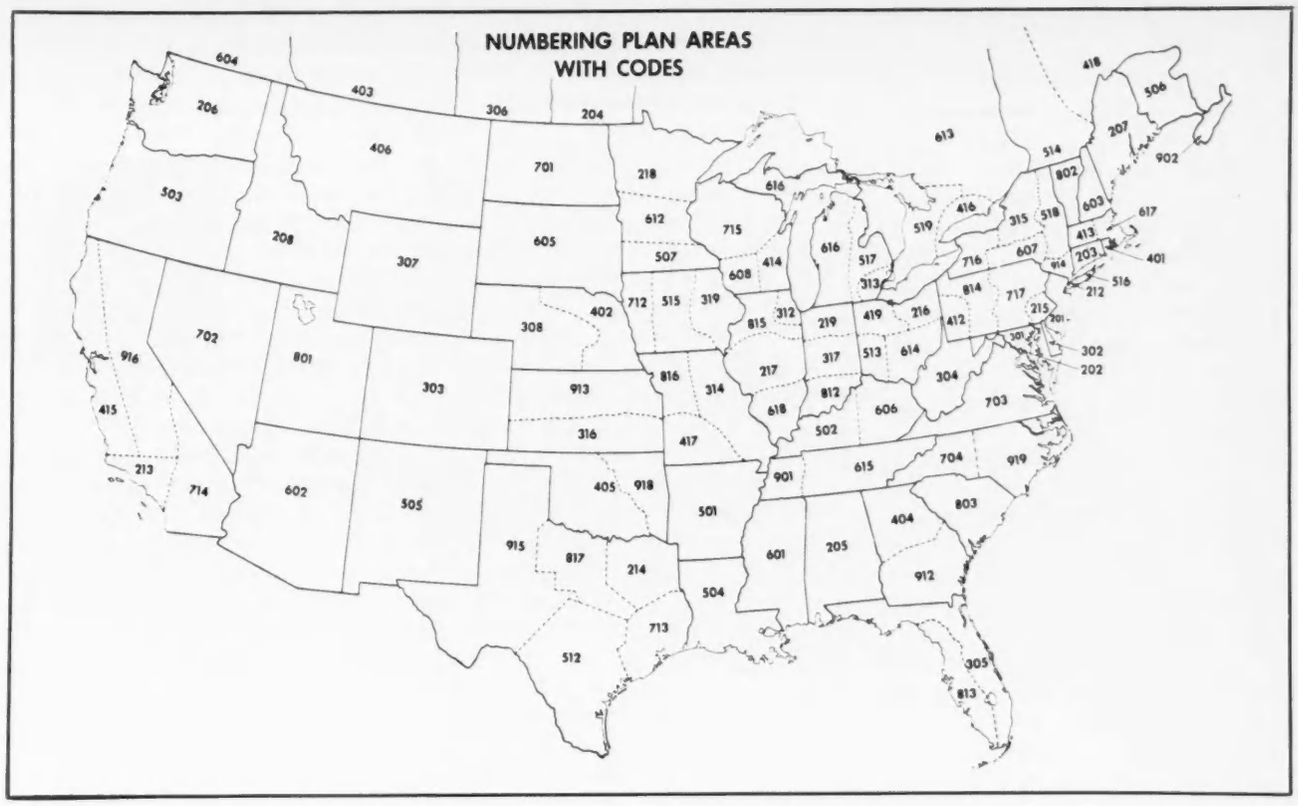


FIGURE ONE: — Numbering plan areas with codes.

The Independent Company and Nationwide Toll Dialing

By L. A. HODSON

***IN SECTION I** of a six-part article written exclusively for "Telephone Engineer & Management" Mr. Hodson discusses — (1) the nationwide toll dialing plan, and (2) code assignments and homing arrangements. Section II of this article will appear in the next issue.*

THE NATIONWIDE toll dialing plan provides for satisfactory overall service between any two telephones in this country and Canada, as many calls as possible being dialed direct by subscribers (Direct Distance Dialing), and as many as possible of the remainder being dialed by operators (Operator Distance Dialing). There are three major requirements to meet this objective:

(1) A universal numbering plan which will reduce the routing information required by subscribers to the minimum.

(2) An automatic switching system which will route a call from the originating telephone to its destination in accordance with the number dialed and which, by automatic selection of alternate routes in the nationwide network, will enable the most economical use to be made of long distance circuits.

(3) A system of limited transmission losses on all toll circuits which will ensure satisfactory overall transmission on all calls.

To provide the universal numbering plan the country has been divided into a number of numbering plan areas each of which has been given a code in the form XIX or XOX, X being any digit from 2 to 9 inclusive. *Figure* 1 shows the numbering plan areas which have so far been established. Within each numbering plan area each central office has been given a code in the form AB-X, in which A and B are alphabetical equivalents of any digit, and X is any digit, from 0 to 9 inclusive. A and B are also the first two letters of the exchange name so that a central office given the name Olympic -3 would

actually have the equivalent numerical code 653.

Within each central office each main station bears a four digit number in the form XXXX, X in this case being any digit from 1 to 0. Every main station in the country is thus identified by an individual 10-digit number, of which the first three digits identify the numbering plan area in which the station is located, the second three identify the central office from which the station is served, and the last four identify the connector terminal to which the station is connected. The switching equipment distinguishes between area codes and office codes by the second digit. The second digit of an area code will always be 1 or 0; the second digit of an office code will never be 1 or 0.

From this it follows that to reach a station in another numbering plan area it is necessary to dial all 10 digits, to reach a station in the same numbering plan area it is necessary to dial only the last seven digits, that is the station's 2-5 directory number, while to reach a station in the same central office it is necessary only to dial the last four digits. The last statement should be modified to the extent that in multi-office areas it may be necessary to dial the last five or the last seven digits, depending on the number of central offices in the area, and that in all central offices it is desirable that provision should be made for the dialing of the full seven digits of the directory number in error, or by transients.

The toll switching plan which enables any main station to be reached by dialing its national code number is illustrated in outline in *Figure* 2. It is built up of toll switching offices of varying degrees of switching ability, dependent on the functions to be performed, linked together by high usage and final routes. High usage routes are provided as required by the traffic and as the costs are justified, on a basis of provision which will ensure that the maximum economic use is made of them. Final routes carry the traffic for which high usage routes are not provided, and the overflow from the high usage routes. Each office has a final route to a higher class of office in the system, on which it is said to 'home.'

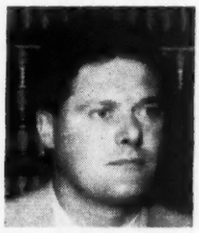
A class 5 or 'end' office is the only class of office to which subscribers are connected. It may be a C.D.O., it may be in the same building as the toll office on which it homes, it may even share the same switching equipment as the toll office. To enable the switching plan to be viewed properly, however, it is looked upon as a separate entity. It has only one toll outlet, the final route to its home toll office.

Class 4C and class 4P offices, that is toll centers and toll points, have equal rank in the switching system, and both must home on a class 3 or higher office. They differ in that a class 4C office has operators to handle both incoming and outgoing calls, whereas a class 4P office does not have operators to handle incoming calls. It may or may not have operators to handle other classes of calls such as outgoing toll, assistance, information, etc. Class 4 offices may or may not have automatic alternate routing facilities depending on the need, the cost, and the savings which could be effected.

Offices in classes 3, 2, 1 and 0 are known as control switching points. They incorporate complex high speed switching equipment which by rapid testing and selection of alternate routes is designed to keep circuit costs to the minimum, and which by translation, deletion and substitution of the code digits offered to it for routing the call, is designed to keep switching equipment costs in lower classes of offices to the minimum.

The transmission requirements of the plan are met by operating all intermediate toll trunks, that is those between offices in classes 0 to 4, at their via net loss. The via net loss of a trunk is the minimum loss at which the circuit can be operated without experiencing appreciable echo, singing or crosstalk. Toll connecting trunks, which connect class 5

L. A. HODSON entered the telephone industry in January, 1935, as an engineer in the British Post Office. In this capacity he was concerned with all types of plant department work, station, P.B.X. and P.A.B.X. installation and maintenance; manual, dial and toll central office installation and maintenance, local and toll testing, carrier and repeater maintenance, until promoted to traffic superintendent in October, 1939. He was employed in this capacity, in local and toll exchange management, and in traffic design of manual, dial, and toll central offices, until he left in 1948 to re-form and direct the Operating Division of the Automatic Telephone & Electric Co., Liverpool, England.



L. A. Hodson

In this post he was responsible for conducting research into the operation and maintenance of telephone systems, for devising standard operating, engineering, and plant practices for the use of the operating companies which purchased the company's products, and for initiating from the findings of the operational research conducted by his department, improvements in equipment design, testing and maintenance. He was also responsible for all customer technical information, for assisting customers in the establishment of plant training school, and for the solution of all operating and maintenance problems which arose after the installation of the equipment.

In 1952 Mr. Hodson fulfilled a long felt ambition to come to the U.S.A. by accepting the post of commercial and traffic manager with the Elyria (Ohio) Telephone Co. Late in 1953, he joined the General Telephone Co. of the Southwest as engineer, and was later appointed special projects engineer to study nationwide toll dialing. Since writing these articles he has joined the Stromberg-Carlson Co. as a toll-ticketing engineer.

During the war Mr. Hodson was commissioned in the Royal Corps of Signals and was primarily concerned with the engineering, construction and maintenance of long distance open wire routes, with the operation and maintenance of long distance radio links, and with training.

offices to class 4 offices, are operated at a loss of VNL plus 2 db, to a maximum loss of 4 db.

It is proposed in this series of articles to deal only with the requirements of the national toll dialing plan with respect to incoming traffic to class 4 and class 5 offices. All but a very small percentage of the Independently owned offices fall into these two categories. The requirements will be considered under the headings of: (1) Code Assignments and Homing Arrangements; (2) Equipment; (3) Testing Facilities; (4) Trunk Provision; (5) Signalling; (6) Transmission, and (7) Costs and Compensation.

Code Assignments and Homing Arrangements

OFFICE CODES are assigned by the local Bell System company in consultation with the Independent company concerned. Tentative codes have been assigned to most offices and all Independent companies should ascertain the codes assigned to their offices to check that they are compatible with economical intertoll trunking arrangements at the toll centers, and with economical extended area service trunking arrangements, if any are proposed, in the end offices. This check should be made at the earliest possible date because as more code assignments are made firm, the possibility of changing code assignments to suit particular trunking schemes is reduced.

Where an office serves subscribers in a different numbering plan area from that in which the office itself is located special arrangements have to be made, and the local Bell System company should be advised of such situations without delay. Early advice is necessary, even though it may not be proposed to convert the office concerned to dial in the near future, because codes will have to be assigned, and protected, in both areas.

Office names are chosen by the Independent company from a list of suitable names, a copy of which can be obtained from the local Bell System company, which bear no relationship to the name of the town in which the office is located. It is expected that the use of a comparatively short, standard, list of office names will reduce the possibility of dialing errors. In selecting office names consideration should be given to simplifying, and reducing the possibilities of error

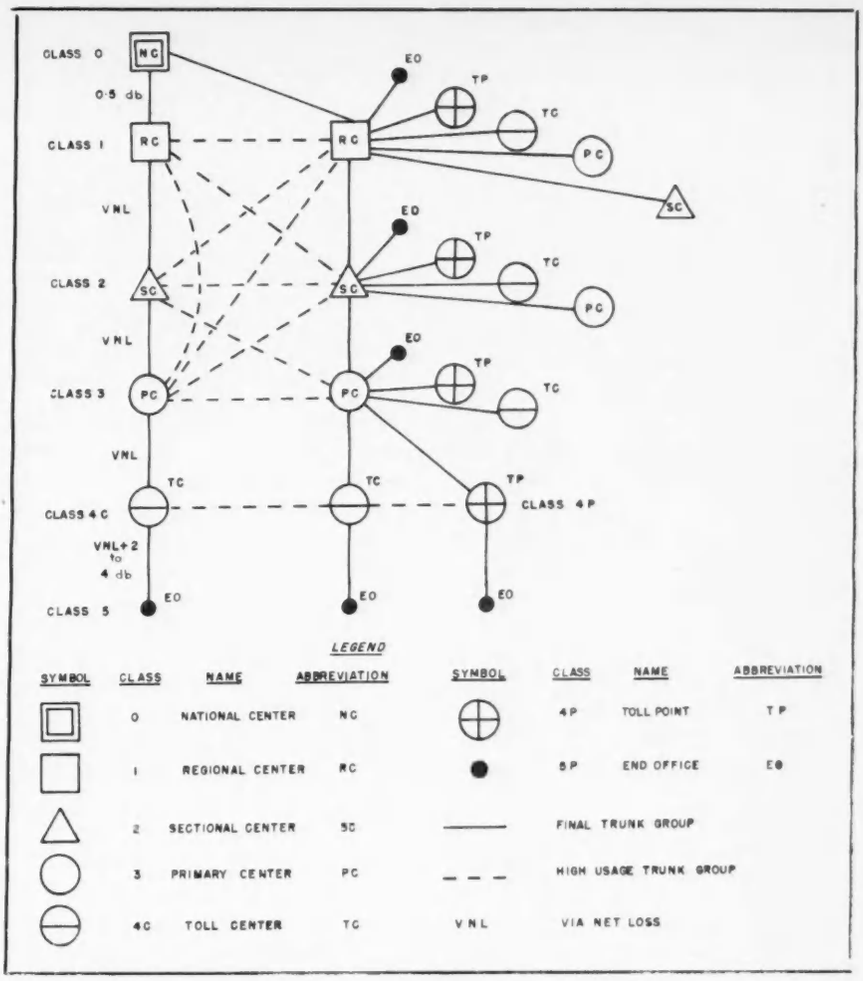


FIGURE TWO· — Toll-switching plan

in, commercial and accounting functions.

Toll centers, in addition to the code for the associated class 5 office, are assigned a T. T. C. code in the form of a three digit numerical code the first two digits of which will be in the range 2-9, and the last digit of which will be preferably, but not always, "0". A typical T.T.C. code is 580. This code, followed by the appropriate operator code, is used to enable distant operators to reach inward, information, delayed call and similar operators at the toll center, and to reach test boards or test equipment.

Toll centers will be established in accordance with the economics of toll switching and of the toll plant layout. Many existing toll centers will disappear. There will be many changes of the types shown in *Figure* 3. Independent Companies should discuss the proposed toll switching plan for the area in which they operate with their local Bell System Company and come to an agreement as to the ultimate classifications, toll center or end office, of their offices, and the ultimate use to be made of Independently owned toll routes. It is most important that the toll plan be examined carefully and that any work done in the future should be in accordance with the agreed arrangements, to ensure that money is not unnecessarily spent in providing, extending, or rehabilitating facilities which will have only a short life in service.

Class 4C and class 4P offices can home on offices in classes 1, 2, or 3. Class 5 offices can home on offices in classes 1, 2, 3, or 4. The transmission limitations of the plan prevent a class 5 office homing on another class 5 office. Each office has a final route to its home office, and high usage routes where the traffic can be more economically routed directly than via the final route.

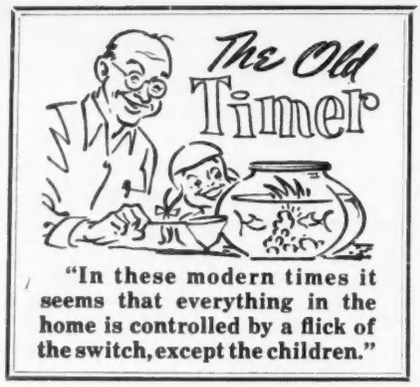
If an office homes directly on a control switching point advantage should be taken of the digit deletion and substitution facilities incorporated in the C. S. P. equipment. For example if a class 5 office LAkeside -4 homed directly on a C. S. P., and

a call to LA-4-2345 were routed into the C. S. P., the C. S. P. equipment could be arranged to delete LA-4 and send only the digits 2345 to the class 5 office, thus eliminating the need for digit absorbing toll selectors in the end office. Advantage can also be taken of these features to reduce the costs of toll switching equipment in class 4 offices, but in these cases prior consideration must be given to the routing of traffic from directly connected toll centers, if any. These offices will normally send seven digits.

It can be seen that if a toll center normally receives seven digits for an incoming call, and the end office only requires four digits to select the required station, three digits have to be used up, either in routing the call through the toll center switching equipment to the end office, or by absorption in the toll center or the end office. If all the digits are not required for routing a cost comparison should be made to ascertain where the surplus digits can be absorbed for the least cost, in the toll center or in the end offices. Usually it will be found less costly to absorb them in the toll center because, due to the greater efficiency of large groups, the number of selectors requiring digit absorbing facilities in the toll center will be less than the total number of selectors which would require digit absorbing facilities in all the end offices.

Regardless of size, no end office should operate to less than four digits. Existing offices which use only three digits will require the addition of digit absorbing features, and the conversion of the subscribers' numbers to the 2-5 type.—***To Be Continued.***

The permission of the American Telephone & Telegraph Co. to use material from the "Notes on Nationwide Dialing" is gratefully acknowledged.



"In these modern times it seems that everything in the home is controlled by a flick of the switch, except the children."

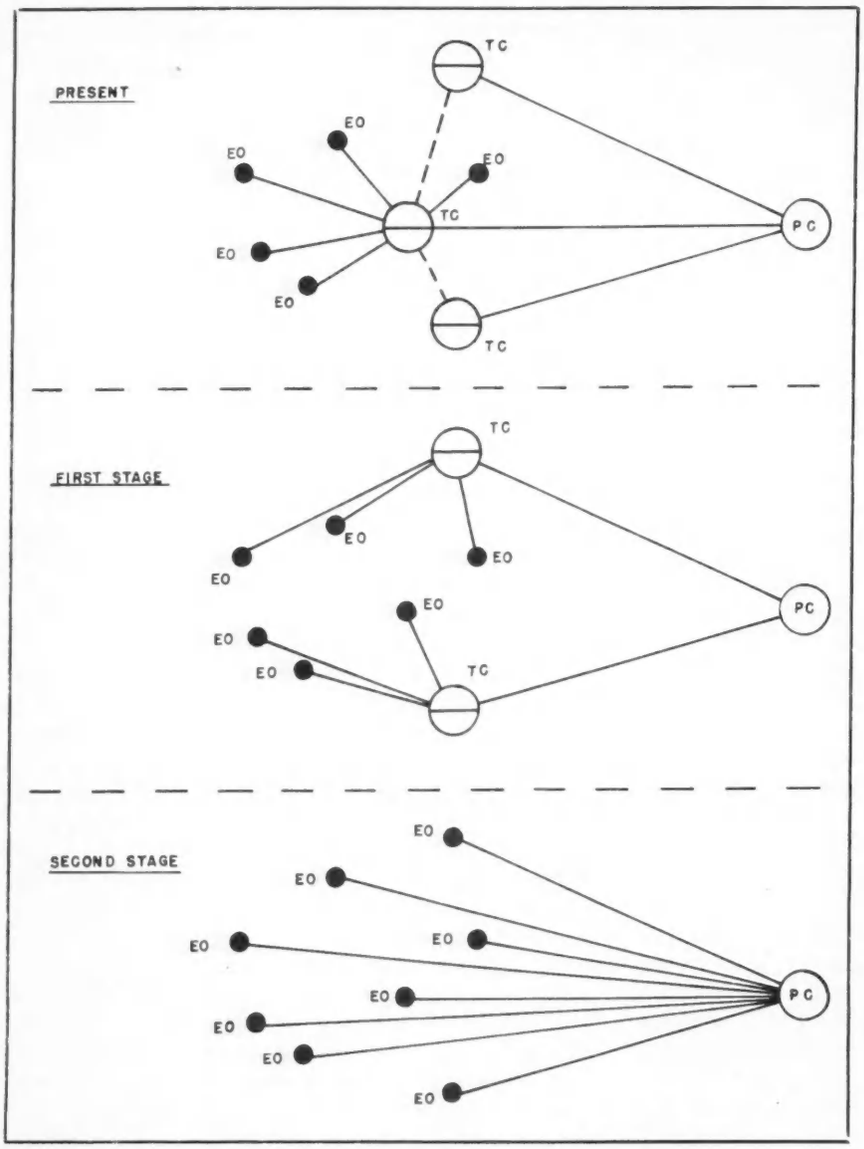


FIGURE THREE: — Typical development of routing arrangements.

Books

"A Pocket Book of Speech Formulas," by Lester Lyle McCreary; 36 pages; published by National Safety Council; price $1.20.

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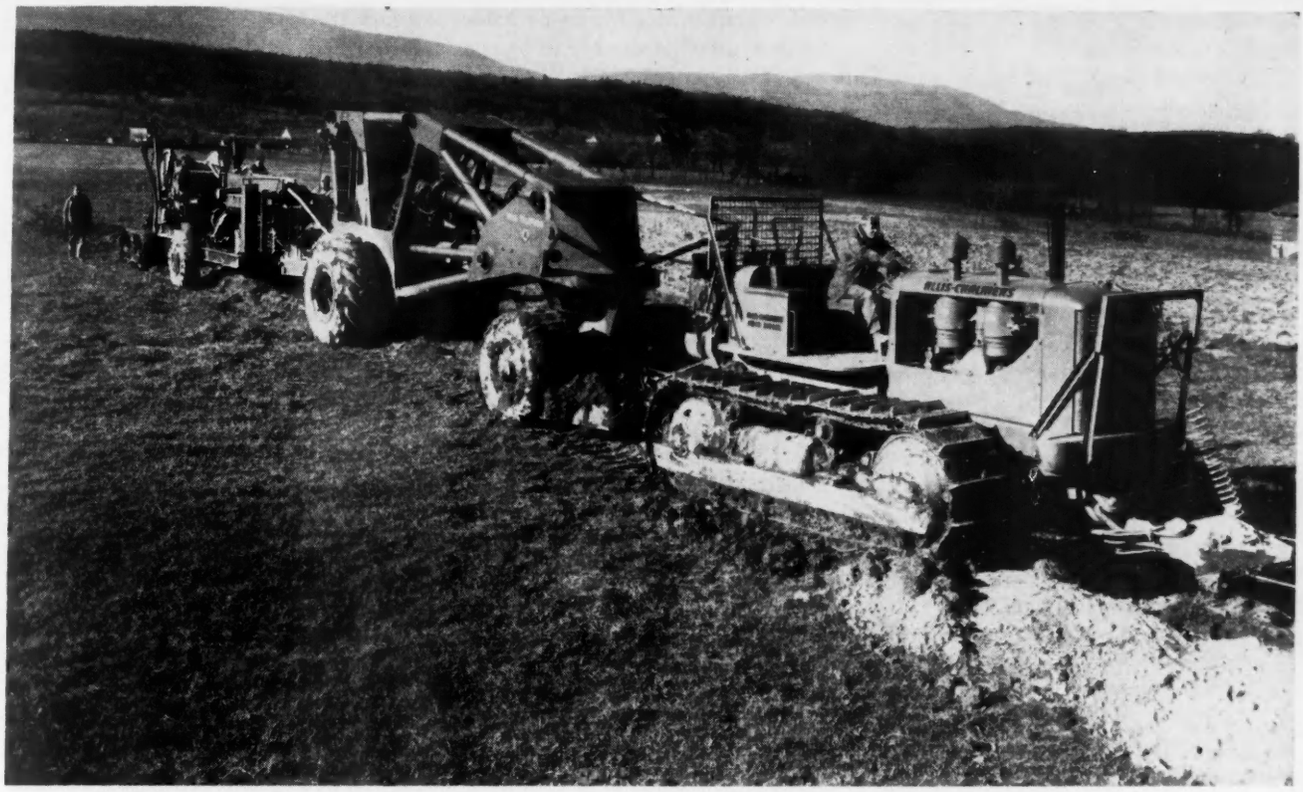


UNDERGROUND cable is often laid by means of a special train which digs the hole, lays the cable and refills the hole.

"The Cable Plow Train"

By T. V. MOUNTEER

LIKE A prehistoric monster, the cable plow train lumbers mile after mile across country, cutting a furrow four feet deep in the earth, laying a long ribbon of cable, and covering it up to ground level.

BACK IN 1878, when Alexander Graham Bell prophesied that "wires will unite the head-offices of the telephone company in different cities, and a man in one part of the country can communicate by word of mouth with another in a different place," he was foreseeing the future with amazing clarity.

Had he been gifted with second sight in addition to sound engineering vision, he might have foretold also that in time these wires would be enclosed in strongly sheathed cable, and that for mile after mile across country, up hill and down dale, the cable would be plowed deep into the earth.

The work of a cable plow train, such as those used by The Bell Telephone Co. of Canada for this operation, never fails to attract a group of spectators, usually divided equally between small boys and their elders. Powered by diesel-engined Caterpillar tractors, the plow train moves steadily through the fields at ordinary walking pace, crossing side roads and creeks with hardly a pause. It buries, at a depth of about four feet, a well-protected cable whose location, in a few weeks, will be distinguishable only by the short black and yellow marker poles erected at boundary points.

Preparation and planning for cable plowing are begun months before the first reels of cable are unloaded at the starting point. Aerial photographs of the country to be crossed are cut up and patched together in a mosaic of the entire route. Bearing in mind that a straight line is the shortest distance between two points, the telephone company's engineers work out on their mosaic a series of straight lines which may not be the shortest but will certainly be the most practical route from point to point.

Many factors must be kept in mind in this preliminary planning. Huge reels of cable have to be spaced along the route so that the train will find new ones waiting to replace empties. These reel-loading points are located as near as possible to road crossings. The entire route, in fact, is laid out to facilitate access from roads not

Continued On Next Page

only during the plowing operation but for future servicing.

The diesel 'cats' can work over pretty rough country, but they don't go looking for trouble, and the engineers study their picture maps carefully to avoid routing through heavy woods, swamps, and rocky ground.

Route Selection

WHEN THE most practical direct route has been laid out on the aerial map, information on the ownership of property to be crossed is compiled from public records and steps are taken to obtain rights of way or permits from the property owners and public authorities concerned. In most cases where private property is to be crossed, arrangements are made with the owner for the use in perpetuity of a strip of land 30 feet wide in which to place cable. The type of rights acquired by the Company is known legally as an "easement" in Ontario, and a "servitude" in Quebec.

The entire route is then surveyed and staked, and maps are prepared showing in detail the line to be followed by the plow train, and the points where cable reels are to be placed, where splices are to be made, and where attachments are to be connected. All fences along the route are cut, and access gates are placed. Big trees and boulders are removed, and test borings are made to determine what conditions are likely to be met under the surface.

The quantity of cable needed, of the specific type and characteristics required for the particular job, is ordered.

Nitrogen gas under pressure is forced into the cable through a valve after the ends are sealed, and any variations from the recorded pressure will warn the telephone cable men of possible damage in transit. On the date set for the beginning of the plowing, cable reels are in their assigned places along the route as the plow train rumbles to its starting point.

Make-Up Varies

THE MAKE-UP of the plow train varies according to the toughness of the job. Usually two plows are used. The first plow, called a 'rooter,' works ahead of the cable plow and opens a trench about 30 inches deep. It is drawn usually by two diesel tractors, the first one hitched to its mate by a powerful winch and a heavy steel cable.

In ordinary ground the rooter train moves along steadily with both tractors pulling in unison. Where a heavy pull is needed, or where soft ground fails to give a firm grip to the wide treads, the first tractor can move ahead to firm ground, anchor itself, and apply extra power by winching in its steel cable. If there are boulders, small trees, or brush to be cleared, or if the steep banks of a road or creek need to be levelled down, the lead tractor does these chores with the bulldozer blade it carries.

Not far behind the rooter crew, the cable plow train follows along the trench already opened. Two tractors provide the power for this operation also, with a strong winch line between them.

Behind the second tractor the cable plow rides on huge pneumatic-tired wheels. The plowshare is a vertical steel column, and it has a deep groove in its after-edge through which the telephone cable is fed. Oil, under pressure, is sprayed over the cable as it enters the plowshare, smoothing its

THIS CABLE PLOW train is laying underground cable across a field. The tank beside the plowshare supplies oil for spraying on cables as they feed through the plow.

passage through the steel channel. The share is forced into the earth by its weight and by the forward movement of the train. As the tractors pull, the trench made by the rooter plow is deepened by the cable plow, usually to 50 inches, and the cable feeding through the opening in the share is stretched in the bottom of the trench.

Two cable trailers, riding on caterpillar treads, usually are hitched in tandem behind the plow. Each trailer carries a reel holding as much as 1,500 feet of cable, weighing perhaps two tons. On some routes, engineered for heavy long distance traffic, both cables are fed through the plow at the same time and laid one below the other in a single trench.

On other routes only a single cable is needed and in such cases, when the leading cable reel is emptied the train pauses while the start of the cable carried on the second trailer is lashed to the disappearing end of the preceding cable, and both are fed through the plowshare as the train moves ahead. This permits an advance of as much as 3,000 feet before the train must be halted to remove the empty reels and put new ones in their place on the trailer racks.

Replaces Earth

AS THE TRAIN moves along, a heavy sled beneath the rear cable trailer pushes the disturbed earth back into the trench. Behind the train a third tractor follows along, its heavy treads packing the earth down above the cable. With the bulldozer blade it carries, this tractor levels off farm lanes or road surfaces torn up by the plow and moves rocks left on the surface of the road or field. (Paved roads crossed by the route are under-passed by means of conduit through which a short piece of cable is pulled, avoiding the need of plowing.)

When both reels have been emptied, the train comes to a halt at a point where loaded reels have been placed already. The "choreboy" tractor rumbles up and brings into play the powerful derrick it carries. The empty reel is removed and put aside. A loaded reel is picked up, jockeyed into position, and hoisted into the cradle of the cable trailer where its axle is securely locked in place. The gas pressure in the new cable is tested and recorded, and the cable end is fed into the plowshare, lashed to the tail end of the preceding section. The train moves along and the job proceeds until the end of the route is reached.

The plow train is followed up by cable splicers who open the over-lapping ends of cable at each splicing point, splice the wire ends together in careful sequence, and enclose the joint in a tight lead sleeve. Gas pressure is restored after each operation, to warn of possible leaks and, where leaks do occur, to prevent moisture from seeping into the sheath until repairs can be made.

At set distances along the cable, detectors are inserted which will flash an electrical warning of pressure changes to the telephone test center, where men watch constantly for signals indicating trouble, or potential trouble in the cable.

The completed cable terminates at either end of the route in a telephone office. Some pairs of the wire it carries may be connected to complicated electronic devices which will make it possible for one pair of wires to carry a number of simultaneous telephone conversations. Other pairs may be used to carry radio programs between broadcasting stations or to serve other communication purposes.

And back along the route which the roaring plow train followed, the farmer with his implements restores the surface of the land to its productive purpose, hardly mindful of the precious voice-ways securely buried under his feet, hardly realizing, when he listens to a radio program, a television program, or makes a long distance telephone call, that they are being carried by the cable buried deep under his wheat-field.—***T. V. Mounteer.***

Taxes

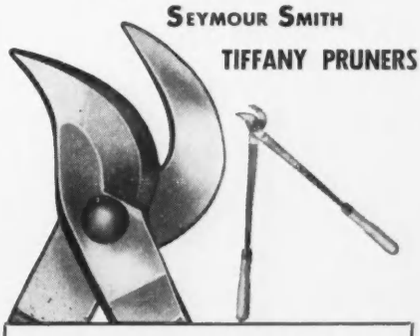
"Suppose that each of us was assessed in one lump sum the same amount we now pay in hidden taxes. This lump sum would have a pretty sobering effect, and those of us who clamor for more and more government services and subsidies would be likely to revise our thinking considerably. . . . The inescapable fact is. . . . that the people have to pay for what their government spends. The amount they pay is going to be the same, whether it is taken from them a cent at a time or in one fat, fearful sum."—Boothbay, Me., Register.

Illustrated above is No. 11 Tree Pruner with center cut action by tempered steel blade that easily handles 1" branches. Head is reinforced malleable iron. Spruce poles with telescoping aluminum joints. For heavier work No. 12-18, capacity 1½". Also Pole Saws.

for clearing brush . . .

SEYMOUR SMITH

TIFFANY PRUNERS



Hand forged throughout. Fast and easy double cut action with thin blades shaped to "draw in." Improved bolt and nut joint, through handle and riveted grip fastening.

FAST-CUTTING SAWS

Blades of Swedish charcoal steel. Large, deep teeth with heavy set to prevent binding. Hand and Pole models for all work up to chain sawing.

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"PHYSICALLY FIT"

By ERNEST W. FAIR

"Consideration should always be given to the employe's physical fitness for the job."

PERFORMANCE of any job with the telephone company from the lineman to the girl at the reception desk depends in great measure on their physical fitness for the job they have been assigned. These physical qualities of health, fitness, strength and vitality make the difference between a good employe and one who performs his or her job so inefficiently as to actually lose money for the company.

These qualities are necessary to efficient workmanship on the job even in those posts where no great amount of strength or exertion is involved in his or her work. They mean the difference between a job well done and one inefficiently performed.

Management's surest point of control of these factors is in application at the time of employe selection and placement. Some attention can be given to the problem after selection has been made but making certain that we secure the right material at the very start is the easiest and least costly method.

Programs of minor athletics sponsored by the company help to keep physical fitness high on the staff after selection. Usually these involve inter-company games such as bowling, baseball, volley ball, etc. with larger companies. Many firms find it worth the small investment to install recreational facilities for such things as hand ball and volley ball on the premises for employe use during rest periods.

Such facilities cost very little and are assurance that the care exercised at the beginning has not been wasted. It often pays to select the staff employe most interested in minor athletics and health and make him or her the company recreational director with a slight additional salary for the added work most of which will be done in his or her spare time.

As mentioned above, however, the most important place for consideration of physical fitness in employes is at the time they are added to the telephone company payroll. There each individual's physical fitness for each job must be considered rather than on a general basis. There are many jobs in every telephone company which require more physical strength, more rapid physical reactions, and more effective physical coordination than others. Setting standards by the requirements of those jobs is an unnecessary procedure and will result in waste. Experience has shown it is much more satisfactory to separate jobs by physical requirements and fit the applicant to the specific job group rather than one over-all set of standards.

Such a program need not be detailed and exhaustive for overall hiring and in fact the average applicant need not know that such requirements exist. On the specific jobs requiring a high degree of physical fitness an actual physical examination should always be made, however.

It is being found, nevertheless, that it pays to exercise a limited degree of physical checking in hiring all employes not only to help eliminate possible chronic ill-health individuals who can never perform even the mildest tasks efficiently but to set up a company record for movement from job to job in the future.

The basic physical examination should include measurement and recording of height, weight, pulse, and respiratory count, presence of contagious disease, serious physical defects or ailments such as hernia, heart trouble, and the like. The small examination fee of any general practicioner is a good investment at this point.

Though it is not by any means a general practice today in any indus-

try, medical authorities are suggesting that it may be advisable in considering applicants for jobs requiring extra levels of physical effort to go even further in such examinations. There are a number of field jobs in the average telephone company where such procedure may be advisable. Suggested checks include physical examinations for such factors as lung capacity, grip strength, back and leg strength, lift capacity, and the like which measure strength, endurance, and physical coordination. They point to these tests as insuring better placement of individuals in such jobs and very possibly reducing accident costs later on.

It is also pointed out that the common practice of selecting men for such jobs purely on a basis of physical size and weight leaves many loopholes for these two standards are by no means absolute guarantees of either good health or physical strength and endurance. The visual checks alone are seldom enough.

Methods of checking, besides actual physical examinations as referred to above (conducted by a doctor) can include such things as thorough reference checks and more searching inquiry during the job interview. It is often very easy, when checking references given on former employes, to look into the physical records and general physical fitness of the applicant as demonstrated on previous jobs he or she has held.

Few such query forms contain requests for such information. It should be in every one we use. It should also be a part of any oral reference checking done by the executive in charge of this field. Following such a procedure will weed out individuals who appear physically capable but who have demonstrated on past jobs that they possess this attribute in appearances only.

Such a check up should also search for the prospective employe's general physical condition in terms of his or her ability to do specific types of work on the job we have in mind, their physical adequacy and most certainly their record of employment with regard to sickness, injury and similar factors.

Experience is also teaching business generally that, with respect to general physical examination of the job applicant, consideration should always be given to the critical physical requirements of the job. Setting up a generalized list of standards may be useful for screening purposes but on jobs within the company where definite physical assets are required the check-up should go beyond any general screening.

Consideration should also be given to periodic tests of employes as a means of making sure this physical fitness is maintained. These are not easy to accomplish with any degree of willingness on the part of employes themselves but are an assurance that the standards possessed at the time of job applicayond any general screening.

Where health and accident insurance are carried by the company it is much easier to institute such a program with the assistance of the insuring company or on one's own as part of the program. Such tests can often be made by executive personnel through observation and checking with foremen and supervisors without the employe's knowledge. If supervisory personnel are instructed to maintain vigilance on the physical fitness of the men and women under them such a periodic check-up becomes an easy matter to handle. While this system of tests will not be perfect they can point up a high degree of success and because of very low cost in practice make themselves desirable in even the smallest company operation.

The whole program is primarily one of making certain of physical fitness when the employe is first hired and placed on a given job and thereafter maintaining an established system of observation to make certain that this level is maintained.

The cost is almost insignificant when compared with the high degree of results obtained from each and every employe within the organization. — ***Ernest W. Fair.***

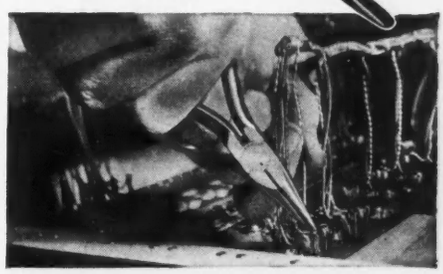
"Sometimes a woman's intuition is just a suspicion that made good!"

AT *Western Electric*

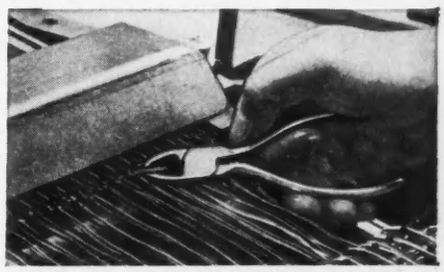
UTICA TOOLS®

HELP SPEED WORK

In three months—at the Western Electric telephone repair service in Syracuse—a pair of these UTICA® No. 2291 pliers has been used to skin the insulation from 22,500 wire ends with no impairment of efficiency in the pliers.



Another popular tool at this Western Electric repair center is UTICA® "Long Nose" No. 226, here shown pulling a cable end through a terminal eyelet.



Skilled hands trim excess wire from multiple cable for a switchboard, using UTICA® No. 241-5" cutters.

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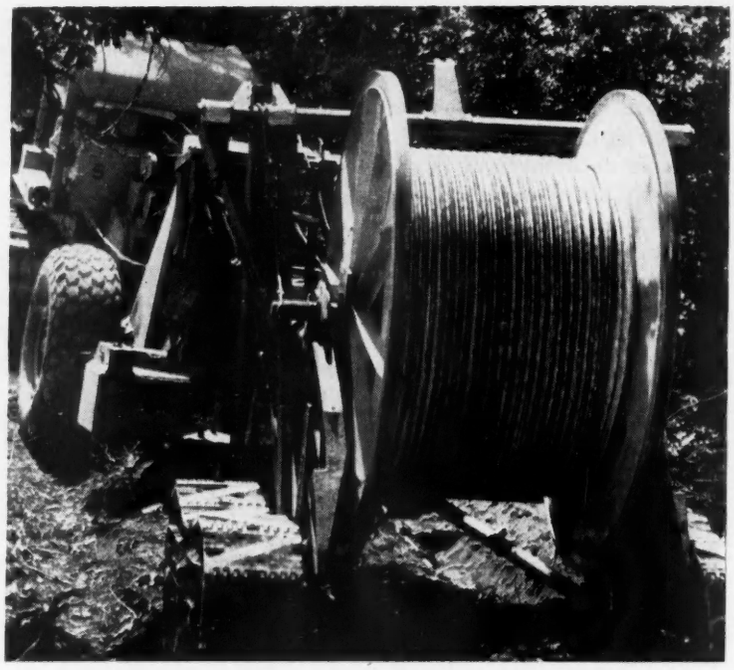
By JOHN S. REED



SECTION V-D of Mr. Reed's article discusses — (1) Tape coverings for cable splices (straight and branch types); and, (2) splicing lead covered cable to plastic-jacketed cable. Section V-C of this article appeared in the August issue.

Modern Cable Construction

Tape Coverings for Cable Splices (Straight and Branch Types)

WITH THE introduction of plastic cables, joints in this kind of cable were insulated and sealed by wrapping with tapes or by using a metal sleeve sealed at the ends with tape coverings. Improvements in various kinds of plastic tape materials have resulted in reasonably satisfactory splice coverings, and many telephone companies have adopted this procedure for their plastic jacketed cable installations.

Cable manufacturers have detailed splicing information which corresponds more or less to Rural Electrical Administration specifications for the use of various kinds of plastic tapes to insulate and seal straight or branch splices in plastic jacketed cables.

The standard R.E.A. splicing procedure makes use of several different kinds of tape for a moisture tight splice covering. One is a filler tape or putty like synthetic rubber. This tape is applied to fill voids in the splice bundle and provide a foundation for subsequent tape layers. This is covered with 7-mil plastic black vinyl tape for mechanical and electrical protection. For the final taping operation, a self-bonding plastic tape is applied followed by a pressure sensitive aluminum foil tape which acts as a moisture vapor barrier. An overall covering of 10-mil black vinyl plastic tape provides additional protection against abrasion. *Figures* 99 and 100 illustrate the various kinds of tape that may be employed.

The first step in the splicing procedure is to remove the outer jacket of the cable to provide a splice opening of 11 inches for 11 and 16 pr., 13 inches for 26 and 51 pr., or 15 inches for 76 and 101 pr. cable, more if required. The jacket is roughened for about 6 inches on each side of the opening, using grade 2½ sandpaper to assure maximum adhesion of the tapes. The shield tape is unwound back to the jacket ends and fastened out of the way. Removing

FIG. 99: — Bishop Manufacturing Corporation plastic tapes for splices in plastic telephone cables. Left — Bishop No. 1 (7-mil) and No. 2 (10-mil) black vinyl electrical tape. Center — Biseal self-bonding polyethylene based electrical tape. Right — Bishop No. 125 electrical filler tape.

the core wrappers then exposes the cable conductors. The individual conductors are spliced and insulated in the approved manner.

The procedure of covering the splice is illustrated in *Figure* 101. If large voids or irregularities are present in the splice bundle, they are filled out with tape filler or electrical insulation putty. One layer of 7-mil vinyl plastic tape is applied half lapped with adhesive side out, followed by one layer applied half lapped with adhesive side in. The vinyl plastic tape is slightly stretched (about 10 per cent) in applying.

The aluminum shield tapes are then wrapped back over the taped splice bundle and the ends soldered together using aluminum flux (Alcoa 64) and 50-50 wire solder or rosin-core solder. (If the ends of the shield tape do not come together, they are joined with a piece of aluminum tape soldered in place.) The tinning and soldering of the aluminum tape ends should be done away from the splice bundle.

The final taping operation requires three kinds of tapes which are applied in a rather unique manner to obtain a smooth tapered splice. The first layer is started to one side of the center of the splice and is laid on with the turns half lapped until the tape covers a portion of the jacket on the left. The tape is cut off at this point and restarted on the other side of the splice center to cover the other section of the splice and portion of the jacket on the right. Each succeeding layers are applied left and right to extend out on the jacket until six inches of the jacket on each side of the splice are covered as illustrated in *Figure* 101. This technique, aptly described as "wrapping down hill," makes a water tight and neat looking splice.

The first four layers on each half of the splice consist of self-bonding plastic tape half lapped over the splice with each layer projecting ½ inch beyond the previous layer over the jacket. Four layers will thus cover two inches of the jacket at each end of the splice. This tape should be stretched not more than twice its length in applying.

The second two layers are composed of 2-inch adhesive-backed aluminum foil tape. Each of these layers extends out one inch on the jacket beyond the previous tape layer making a total distance of two inches for the two layers. Each aluminum foil tape layer is smoothed down with the rounded part of a wooden cable dresser, the shank of a screwdriver or similar smooth object. This removes voids and makes a water tight seal.

The final step is to apply two layers of 10-mil vinyl plastic tape over the aluminum foil tape layers. Each layer covers the splice and one inch

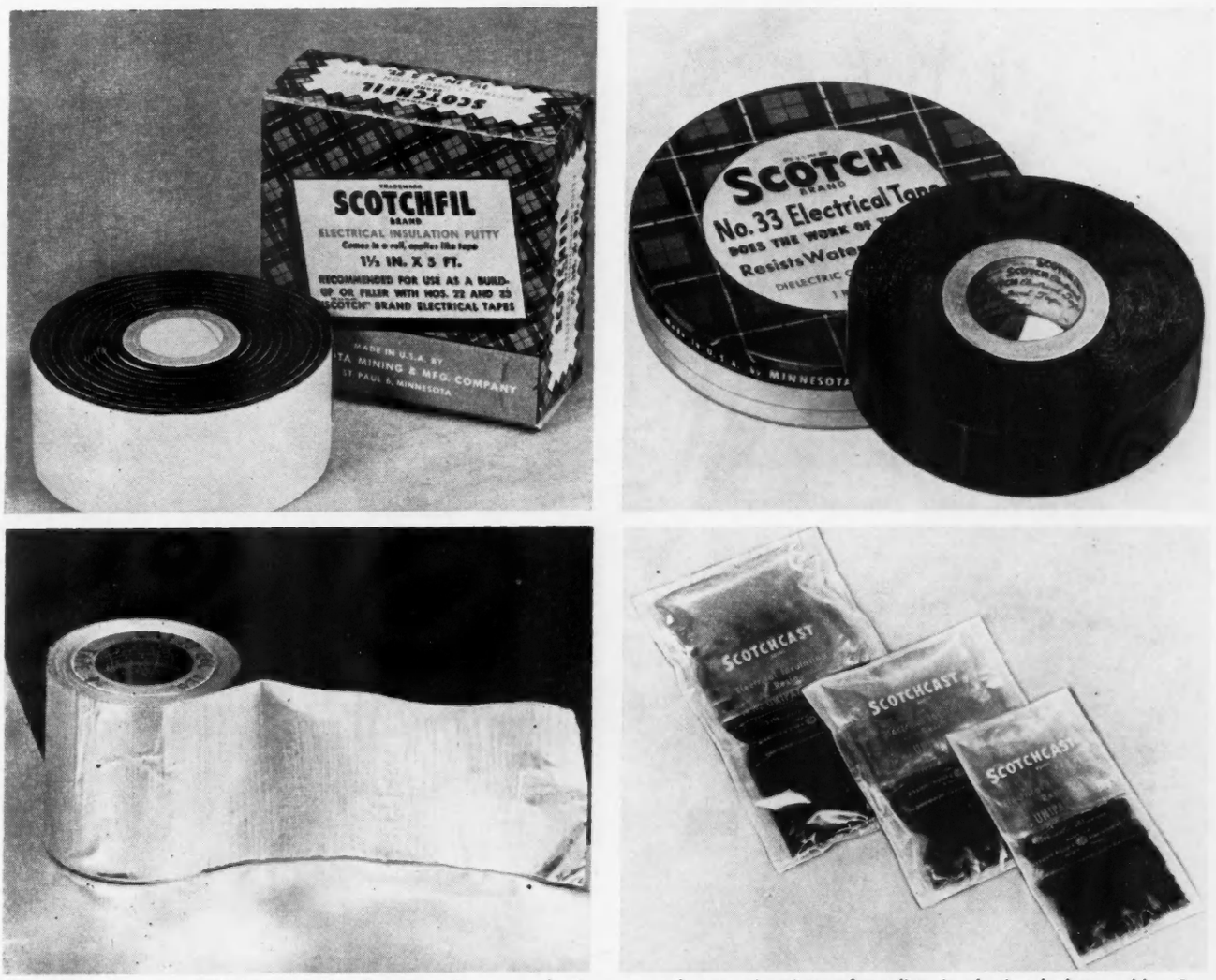
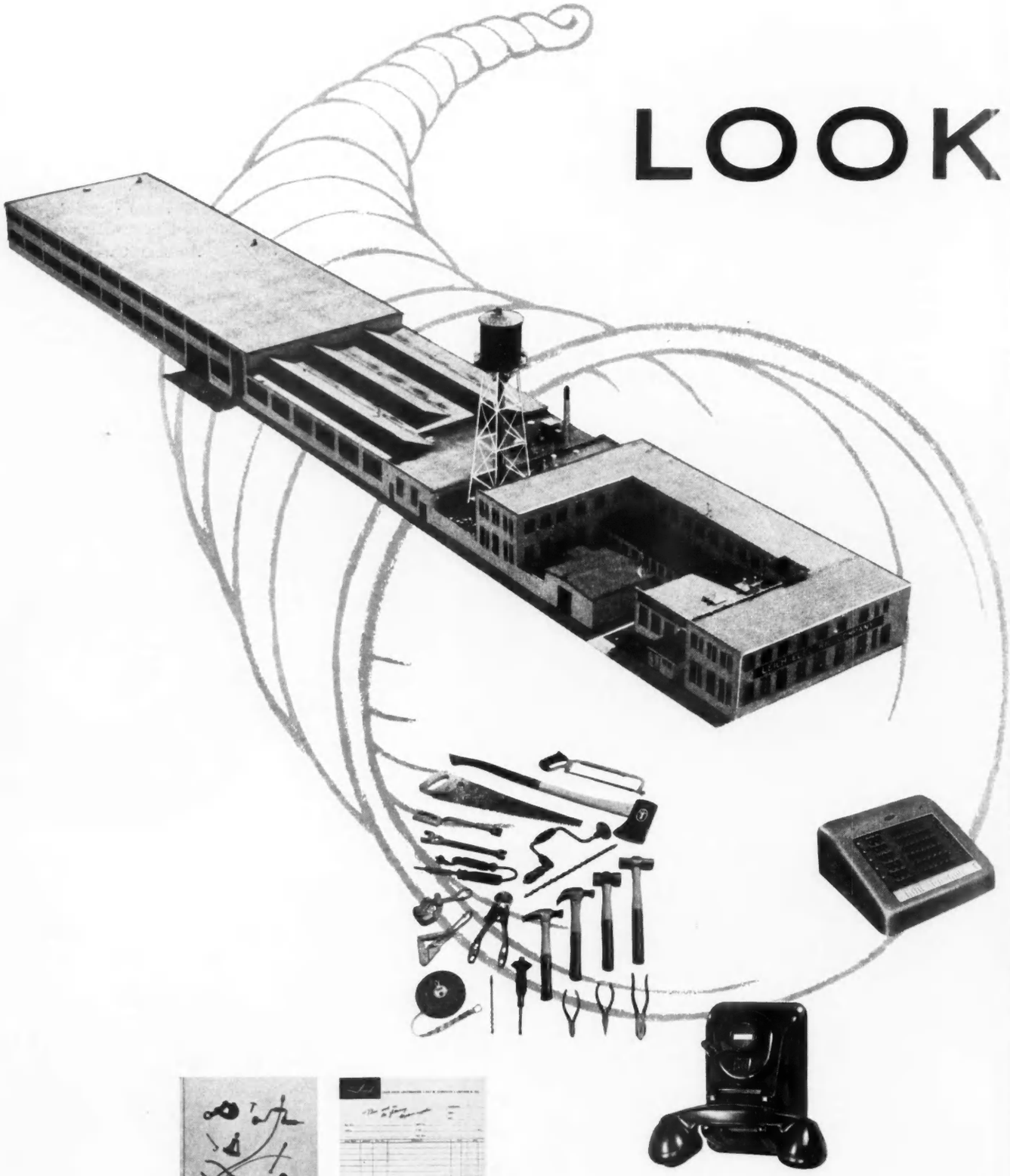


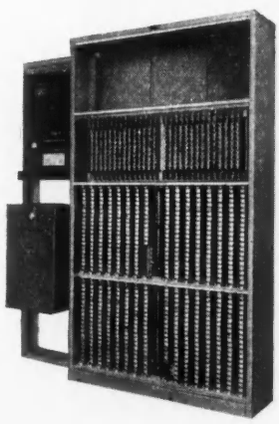
FIG. 100: — Minnesota Mining and Manufacturing Company plastic tapes and cast resin mixture for splices in plastic telephone cables. Top left — "Scotchfil" electrical insulation putty. Top right — "Scotch" No. 33 (7-mil) and No. 22 (10-mil) electrical tape. Bottom left — "Scotch" No. 49 pressure sensitive aluminum foil tape. Bottom right — "Scotchcast" electrical insulating resin No. 4 in "Unipak" container. Complete instructions are also available from this company for using their products in plastic cable splice coverings.

LOOK



LEICH

K TO LEICH...



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GENERAL SYSTEM

of the jacket beyond the previous layer for a total distance of two inches for the two layers.

When required, grounding of the shield tape in the plastic jacketed cable is accomplished by soldering a length of 1/16″ x 3/8″ copper bonding ribbon to the shield after rewrapping the shield tape over the splice. The bonding ribbon is interlaced with the tape wrappings to prevent moisture entry along the ribbon. The free end of the ribbon emerging from the splice is bowed out slightly, taped to the cable jacket for three inches beyond the end of the tape covering, curved to meet the messenger strand, and connected thereon by means of an approved connector.

No. of Pairs In Main Cable	Recommended Length of Splice Opening For Branch Cable Spliced to Main Cable					
	11 Pr.	16 Pr.	26 Pr.	51 Pr.	76 Pr.	101 Pr.
11	11″					
16	11″	11″				
26	11″	11″	13″			
51	11″	11″	13″	13″		
76	13″	13″	13″	15″	15″	
101	13″	13″	13″	15″	15″	17″

Determining length of splice opening.

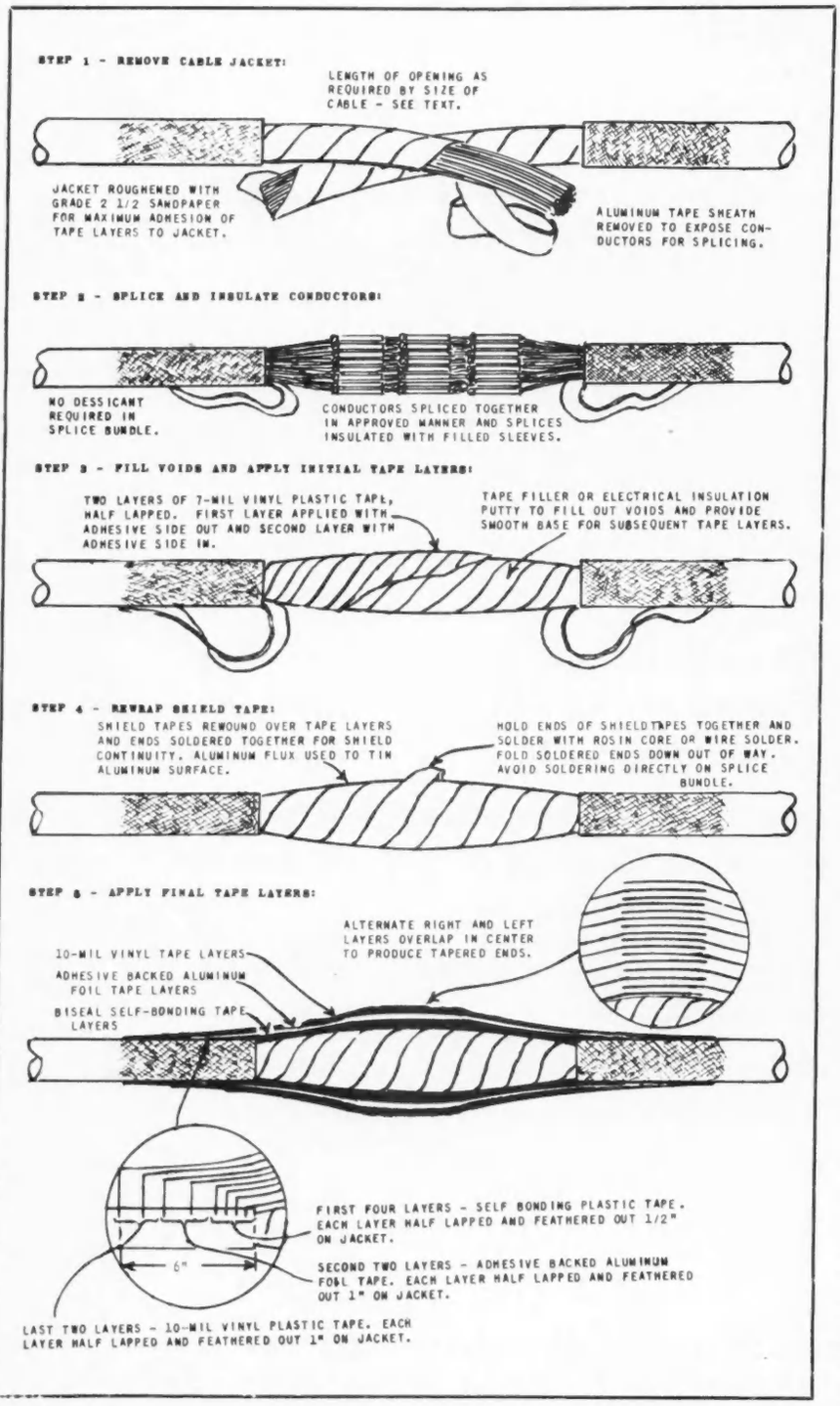
STEP 1 - REMOVE CABLE JACKET:
LENGTH OF OPENING AS REQUIRED BY SIZE OF CABLE - SEE TEXT.
JACKET ROUGHENED WITH GRADE 2 1/2 SANDPAPER FOR MAXIMUM ADHESION OF TAPE LAYERS TO JACKET.
ALUMINUM TAPE SHEATH REMOVED TO EXPOSE CONDUCTORS FOR SPLICING.
STEP 2 - SPLICE AND INSULATE CONDUCTORS:
NO DESSICANT REQUIRED IN SPLICE BUNDLE.
CONDUCTORS SPLICED TOGETHER IN APPROVED MANNER AND SPLICES INSULATED WITH FILLED SLEEVES.
STEP 3 - FILL VOIDS AND APPLY INITIAL TAPE LAYERS:
TWO LAYERS OF 7-MIL VINYL PLASTIC TAPE, HALF LAPPED. FIRST LAYER APPLIED WITH ADHESIVE SIDE OUT AND SECOND LAYER WITH ADHESIVE SIDE IN.
TAPE FILLER OR ELECTRICAL INSULATION PUTTY TO FILL OUT VOIDS AND PROVIDE SMOOTH BASE FOR SUBSEQUENT TAPE LAYERS.
STEP 4 - REWRAP SHIELD TAPE:
SHIELD TAPES REWOUND OVER TAPE LAYERS AND ENDS SOLDERED TOGETHER FOR SHIELD CONTINUITY. ALUMINUM FLUX USED TO TIN ALUMINUM SURFACE.
HOLD ENDS OF SHIELD TAPES TOGETHER AND SOLDER WITH ROSIN CORE OR WIRE SOLDER. FOLD SOLDERED ENDS DOWN OUT OF WAY. AVOID SOLDERING DIRECTLY ON SPLICE BUNDLE.
STEP 5 - APPLY FINAL TAPE LAYERS:
ALTERNATE RIGHT AND LEFT LAYERS OVERLAP IN CENTER TO PRODUCE TAPERED ENDS.
10-MIL VINYL TAPE LAYERS
ADHESIVE BACKED ALUMINUM FOIL TAPE LAYERS
BISEAL SELF-BONDING TAPE LAYERS
6"
FIRST FOUR LAYERS - SELF BONDING PLASTIC TAPE. EACH LAYER HALF LAPPED AND FEATHERED OUT 1/2" ON JACKET.
SECOND TWO LAYERS - ADHESIVE BACKED ALUMINUM FOIL TAPE. EACH LAYER HALF LAPPED AND FEATHERED OUT 1" ON JACKET.
LAST TWO LAYERS - 10-MIL VINYL PLASTIC TAPE. EACH LAYER HALF LAPPED AND FEATHERED OUT 1" ON JACKET.

FIG. 101: — Method of enclosing splice in plastic to plastic telephone cables using plastic tapes.

The procedure for insulating and sealing branch splices with tape coverings is essentially the same as for a straight splice, the chief difference being that a wye grommet is used in the crotch of the splice as illustrated in *Figure* 102. The length of the splice opening is determined by the number of branch cable pairs as well as the main cable pairs as indicated in the above table.

A thin coating of cement (Scotch Kote electrical coating or U. S. Rubber Co. rubber cement) is applied over the inside of the grommet and the portions of the cable jackets to be covered by the grommet. The grommet is then positioned in splice crotch and secured with several turns of tape. The grommet will hold the branch and main cables in place during the splicing operation and then it can be taped over along with the splice bundle.

Splicing Lead Covered to Plastic Jacketed Cables

THE JOINING of lead covered to plastic jacketed cables requires the use of a lead sleeve and a cast epoxy resin plug to seal the splice bundle from the rest of the plastic jacketed cable. When it is company practice to use dessicant in lead covered cable splices, the same practice should apply to joints of lead covered to plastic jacketed cables. Dessicant need not be used in splice bundles of plastic to plastic cables.

As shown in *Figure* 103, the cable coverings are removed to provide 11½ inches opening for cable sizes up to 51 pairs or 13½ inches for 76 to 152 pairs. The lead sheath is shaved for a distance of 4 inches to clean and brighten the surface and the core wrapper is removed. On the plastic jacketed cable, about 7 inches of the jacket is roughened with grade 2½ sandpaper. The shield tape is then unwrapped back to the jacket and the core wrapper removed. Then

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To Meet Your Guying Needs
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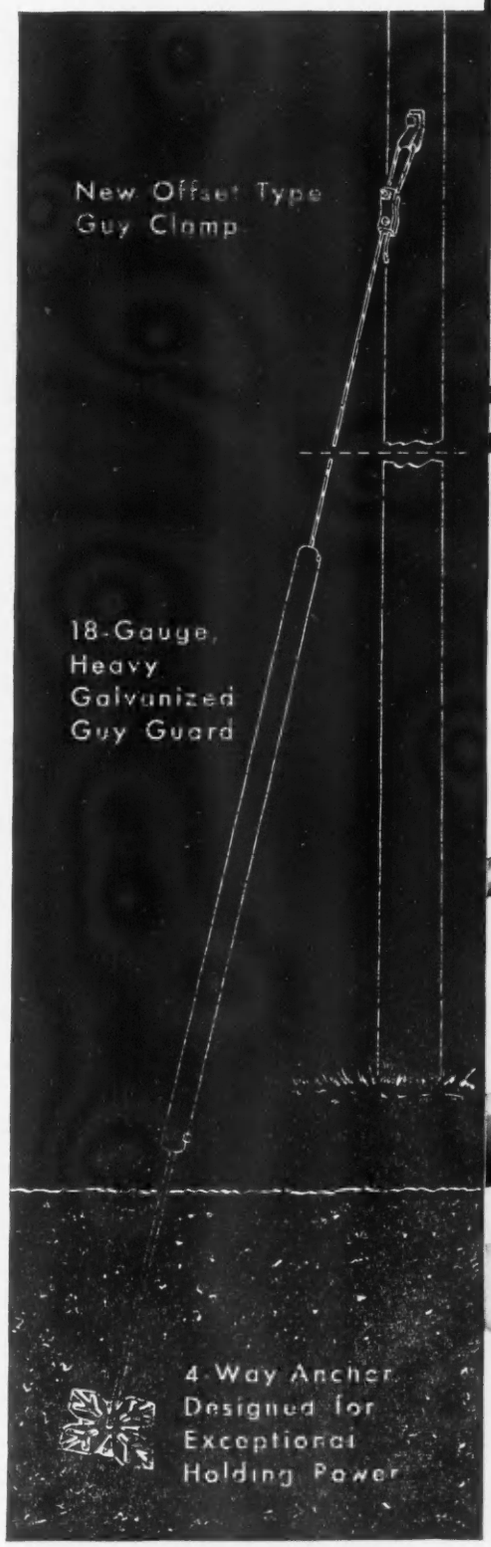

L-M's New Offset Guy Clamp

Two sizes: Cat. No. 221522A2 for 5/16" to 1/2" Guy Wire
Cat. No. 221522A1 for 1/4" to 3/8" Guy Wire

Here's a new guy clamp design with superior holding power—in excess of the breaking strength of the strand accommodated.

The offset grooves tend to snub the cable under load, effectively restraining the slip of the cable.

L-M's new offset guy clamp saves on initial cost and installation time.

L-M's Guy Guard *clamps firmly*

Cat. No. 280024B1 Length 8 Feet; 280024B2 Length 7 Feet

L-M's guy wire protectors have a tight anti-rattle hook at upper end and unique anchor rod clamp at lower end. Position of bolt on side of protector facilitates tightening of lower clamp. No loose parts to fall out.

Body is 18-gauge steel with a heavy hot-dip galvanized coating to assure long-lasting protection. Available in two lengths.

L-M's 4-Way Pressed Steel Expanding Anchors

designed for exceptional strength

Catalog Number	Nominal Holding Power Class—Pounds	Anchor Rod Diameter—Inches	Minimum Mechanical Strengths, Pounds
200026B1	6,000	5/8, 3/4	16,000
200026B2	8,000	5/8, 3/4	21,000
200026B3	10,000	1	24,000
200026B4	10,000	5/8, 3/4	24,000

Two-piece design . . . The four blades are formed of a single piece of steel and coordinate with the sturdy base plate to develop maximum holding power.

Blades are designed to provide minimum resistance to earth penetration during installation and maximum resistance to pull-out when in expanded position.

These anchors have been thoroughly tested and approved by major utility companies. You can depend on them to hold!

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Grommet Size	
#1	For cutting terminal tails in on 11-16-26 pr. cable. (all gauges)
#2	For cutting terminal tails in on 51-76-101 pr. (22 gauges)
#3	For branch splices in cables, all gauges, up to 76 pr.
#4	For cutting in terminal on 101 pr., 19 gauge to 202 pr. (any gauge)
#5	For cutting in terminal on 202 pr. to 404 pr. (any gauge)
#6	For branch splices of cables up to 76 pr. (any gauge) to 101 pr. and 202 pr. Incl.
#7	For branch splices of cables up to 76 pr. (any gauge) to 202 pr. and 404 pr. Incl.
#8	For branch splices of cables from 101 pr., 202 pr. any gauge to 202 pr. and 404 pr. any gauge.
#9	For branch splices of cables 202 pr. and 404 pr. to 202 and 404 pr. Incl.

FIG. 102: — Branch splice in plastic to plastic cable using Wye grommet and plastic tape.

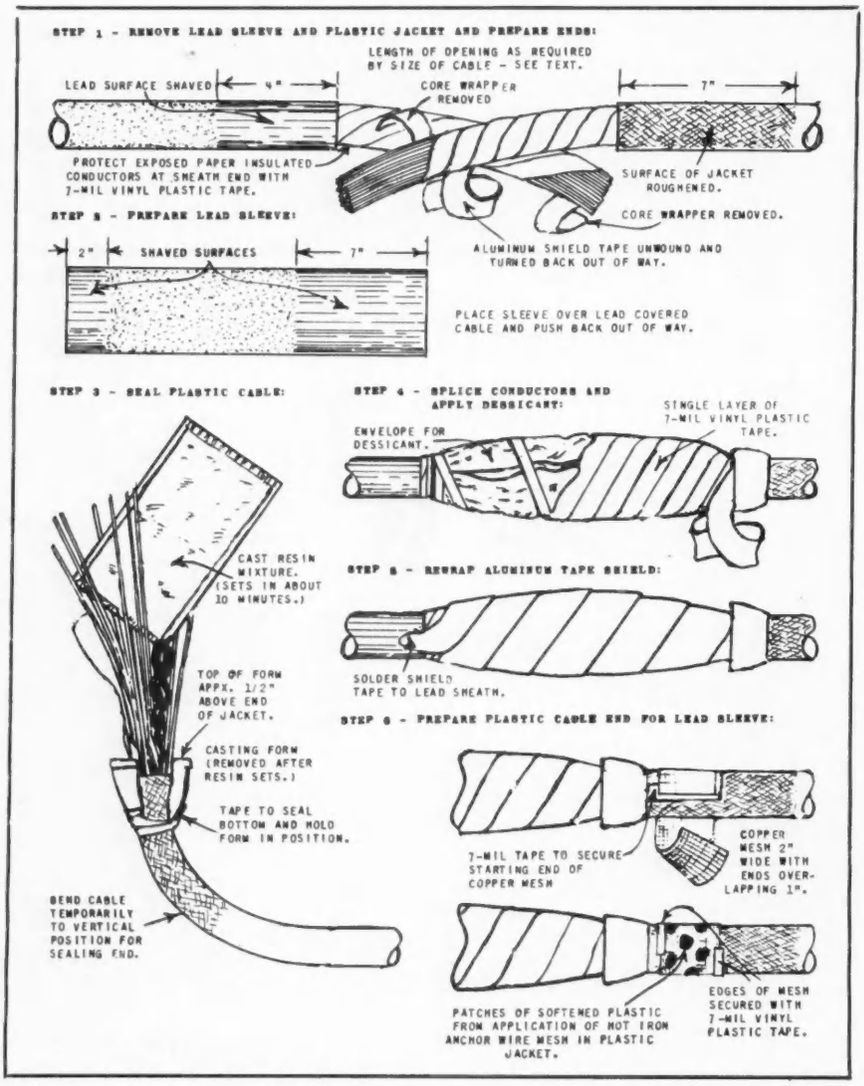
STEP 1 - REMOVE LEAD SLEEVE AND PLASTIC JACKET AND PREPARE ENDS:
LENGTH OF OPENING AS REQUIRED BY SIZE OF CABLE - SEE TEXT.
LEAD SURFACE SHAVED
4"
CORE WRAPPER REMOVED
7"
PROTECT EXPOSED PAPER INSULATED CONDUCTORS AT SHEATH END WITH 7-MIL VINYL PLASTIC TAPE.
SURFACE OF JACKET ROUGHENED.
CORE WRAPPER REMOVED.
ALUMINUM SHIELD TAPE UNWOUND AND TURNED BACK OUT OF WAY.
STEP 2 - PREPARE LEAD SLEEVE:
2"
SHAVED SURFACES
7"
PLACE SLEEVE OVER LEAD COVERED CABLE AND PUSH BACK OUT OF WAY.
STEP 3 - SEAL PLASTIC CABLE:
CAST RESIN MIXTURE. (SETS IN ABOUT 10 MINUTES.)
TOP OF FORM APPX. 1/2" ABOVE END OF JACKET.
CASTING FORM (REMOVED AFTER RESIN SETS.)
TAPE TO SEAL BOTTOM AND HOLD FORM IN POSITION.
BEND CABLE TEMPORARILY TO VERTICAL POSITION FOR SEALING END.
STEP 4 - SPLICE CONDUCTORS AND APPLY DESSICANT:
ENVELOPE FOR DESSICANT.
SINGLE LAYER OF 7-MIL VINYL PLASTIC TAPE.
STEP 5 - REWRAP ALUMINUM TAPE SHIELD:
SOLDER SHIELD TAPE TO LEAD SHEATH.
STEP 6 - PREPARE PLASTIC CABLE END FOR LEAD SLEEVE:
7-MIL TAPE TO SECURE STARTING END OF COPPER MESH
COPPER MESH 2" WIDE WITH ENDS OVERLAPPING 1".
EDGES OF MESH SECURED WITH 7-MIL VINYL PLASTIC TAPE.
PATCHES OF SOFTENED PLASTIC FROM APPLICATION OF HOT IRON ANCHOR WIRE MESH IN PLASTIC JACKET.

FIG. 103: — Steps in preparing joint between plastic jacketed and lead covered cables for enclosure with lead sleeve.

the lead sleeve is prepared for the splice by shaving 7 inches of one end (for the plastic cable) and two inches of the other end (for the lead covered cable) and is placed over the lead covered cable to one side out of the way. Sizes of sleeves suitable for the splice are as follows:

Cable	Lead Sleeve
11 to 51 pairs	1½" dia. x 15" long
76 to 101 pairs	1¾" dia. x 17" long
152 pair	2" dia. x 17" long

To make the moisture plug at the plastic cable end of the splice, a form is prepared from any suitable material such as thin cardboard shaped into a cone, or a nursing bottle shield may be adapted by cutting a hole to fit the mold snugly over the cable. After placing the mold on the cable and pushing it out of the way, the end of the cable is turned up and secured in a vertical position. The cable conductors and shield tape are spread apart to enable the casting mix to flow into the interstices. The form is then slid into position with its top about ½ inch above the end of the jacket and is secured in place with tape around the bottom of the form and the jacket.

The casting mix ("Scotchcast" Resin No. 4) is prepared by breaking the partition seal in the "Unipak" plastic bag and kneading the bag to mingle the ingredients thoroughly. The mixture is poured into the form nearly to the top and allowed to set for about 10 minutes or until the resin has hardened sufficiently for stripping off the form and removing any adhering material. The cast plug and form are illustrated in *Figure* 103.

The conductors are then spliced together in the approved manner. When dessicant is to be applied to the splice bundle, an envelope is formed from a thin sheet of polyethylene plastic and placed around the splice bundle. The required amount of dessicant is applied through the opening in the top of the envelope. The envelope is closed and secured with tape spiraled around it. A single layer of 7-mil vinyl plastic tape is applied, half lapped, around the splice bundle without going over the ends of the jacket on each side of the splice.

The shield tape is next wrapped around the splice to the lead sheath and soldered thereunto, piecing out the shield tape with a length of aluminum tape if necessary. Aluminum

flux (Alcoa 64) is needed to properly tin the aluminum strip, and 50-50 or rosin-core solder is employed for soldering the shield tapes together and the end of the tape to the lead sheath.

Before the lead sleeve can be placed over the taped and shielded bundle, the plastic jacket must be covered with a fine copper mesh to which the lead sleeve will be soldered. A 3½" strip of vinyl plastic tape is placed lengthwise on the jacket with one end against the resin plug. The end of a 2" wide strip of copper mesh is placed on the tape and wrapped around the cable to overlap the ends about 1 inch. Vinyl plastic tape is then wrapped around the cable over the edges of the wire mesh to secure it in place. The wire mesh is embedded in the plastic jacket by applying a hot soldering iron to this material until the plastic melts through as shown by a dark spot appearing on the mesh. The iron is applied at

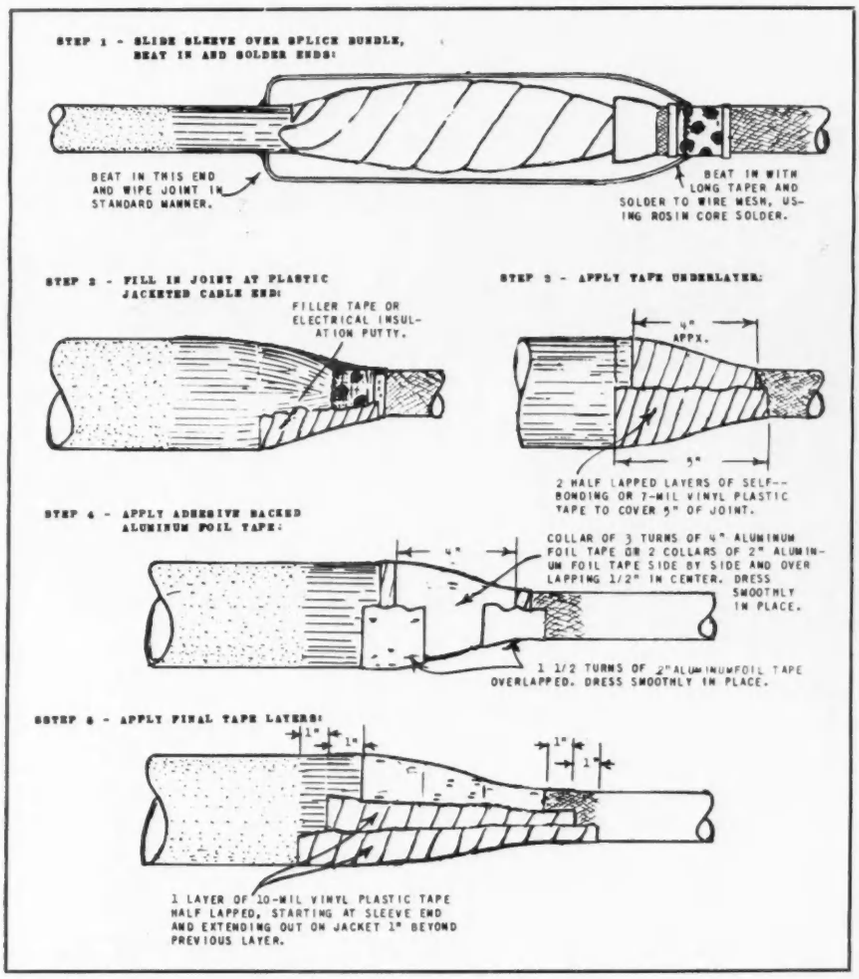
STEP 1 - SLIDE SLEEVE OVER SPLICE BUNDLE, BEAT IN AND SOLDER ENDS:
BEAT IN THIS END AND WIPE JOINT IN STANDARD MANNER.
BEAT IN WITH LONG TAPER AND SOLDER TO WIRE MESH, USING ROSIN CORE SOLDER.
STEP 2 - FILL IN JOINT AT PLASTIC JACKETED CABLE END:
FILLER TAPE OR ELECTRICAL INSULATION PUTTY.
STEP 3 - APPLY TAPE UNDERLAYER:
4" APPX.
5"
2 HALF LAPPED LAYERS OF SELF-BONDING OR 7-MIL VINYL PLASTIC TAPE TO COVER 5" OF JOINT.
STEP 4 - APPLY ADHESIVE BACKED ALUMINUM FOIL TAPE:
4"
COLLAR OF 3 TURNS OF 4" ALUMINUM FOIL TAPE OR 2 COLLARS OF 2" ALUMINUM FOIL TAPE SIDE BY SIDE AND OVER LAPPING 1/2" IN CENTER. DRESS SMOOTHLY IN PLACE.
1 1/2 TURNS OF 2" ALUMINUMFOIL TAPE OVERLAPPED. DRESS SMOOTHLY IN PLACE.
STEP 5 - APPLY FINAL TAPE LAYERS:
1"
1"
1"
1"
1 LAYER OF 10-MIL VINYL PLASTIC TAPE HALF LAPPED, STARTING AT SLEEVE END AND EXTENDING OUT ON JACKET 1" BEYOND PREVIOUS LAYER.

FIG. 104: — Final steps in enclosing joint between plastic jacketed and lead covered cables with lead sleeve.

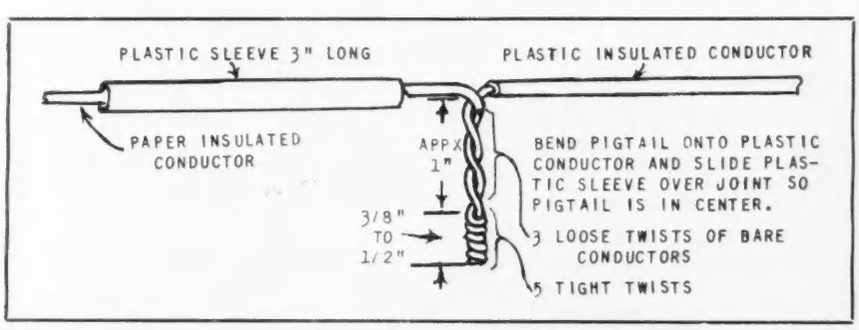
PLASTIC SLEEVE 3" LONG
PLASTIC INSULATED CONDUCTOR
PAPER INSULATED CONDUCTOR
APPX 1"
3/8" TO 1/2"
BEND PIGTAIL ONTO PLASTIC CONDUCTOR AND SLIDE PLASTIC SLEEVE OVER JOINT SO PIGTAIL IS IN CENTER.
3 LOOSE TWISTS OF BARE CONDUCTORS
5 TIGHT TWISTS

FIG. 105: — Use of plastic sleeves on joints in cable conductors.

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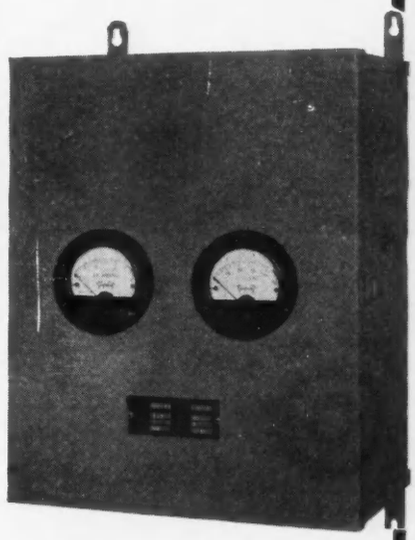

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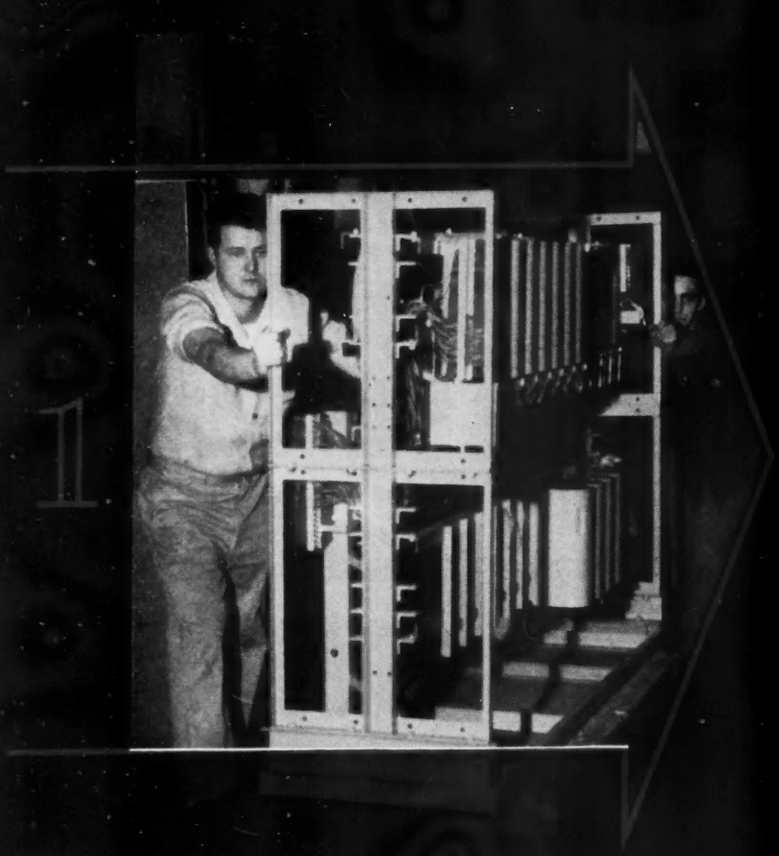

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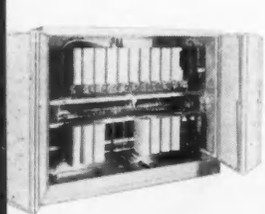

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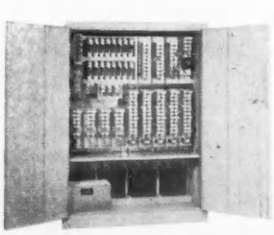

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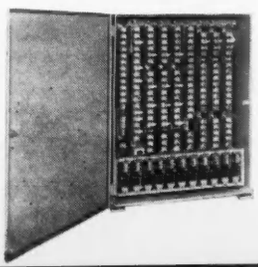

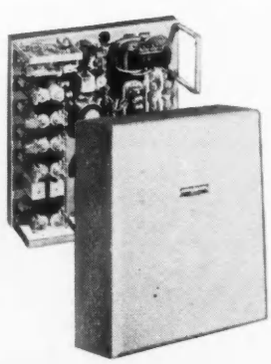

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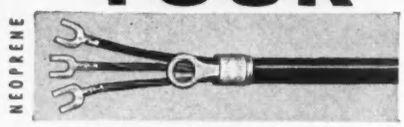

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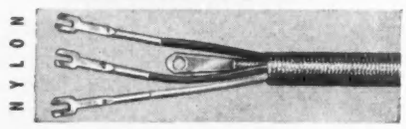

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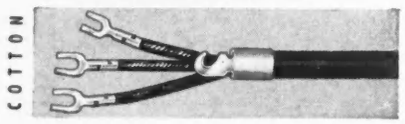

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different places on the wire mesh until the latter is firmly anchored on the jacket. This procedure is shown in *Figure* 103.

As indicated in *Figure* 104, the lead sleeve is moved into a position where it overlaps the lead covered cable sheath about 1½ inches and the plastic jacket about 1 inch. The end of the lead sleeve is beaten in to meet the lead sheath and is wiped to it in the standard manner. The other end of the sleeve is also beaten in to meet the wire cloth. This end has a long taper to facilitate the final taping operation and is soldered to the wire cloth with rosin core solder.

Several steps are involved in the final taping operation. First, the joint between the lead sleeve and the plastic jacket is filled with tape filler or insulation putty to obtain a smooth even surface covering about 2 inches on the sleeve and 2 inches on the jacket. This is followed by two layers of self-bonding plastic tape, or 7-mil vinyl plastic tape, half lapped and extending about five inches to cover the filler layer and ½ inch of the sleeve and jacket.

The next step is to place a collar composed of three wraps of 4″ or 2″ adhesive backed aluminum foil tape centered on the layer of plastic tape. This collar is smoothed down with the round part of a wooden dresser or the shank of a screw driver to remove voids. Over each end of the aluminum tape layer is applied 1½ turns of 2″ adhesive backed aluminum foil tape overlapping onto the jacket and sleeve about ½ inch. The two end layers are dressed down to a smooth tight fit.

In the final step, one layer of 7-mil vinyl plastic tape is applied starting

"The Socialists will never take over this country. They couldn't afford to pay the taxes!"

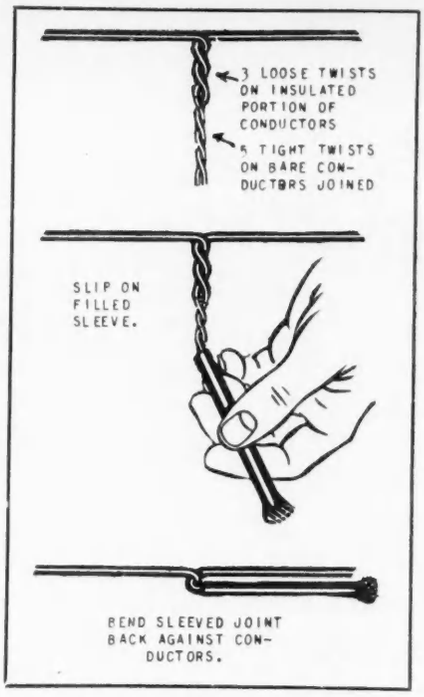

3 LOOSE TWISTS ON INSULATED PORTION OF CONDUCTORS
5 TIGHT TWISTS ON BARE CONDUCTORS JOINED
SLIP ON FILLED SLEEVE.
BEND SLEEVED JOINT BACK AGAINST CONDUCTORS.

FIG. 106: — Superior Cable Corporation "Supersleeve" plastic filled sleeves for insulating joints in cable conductors.

at the sleeve end and half lapped to cover the aluminum foil tape layer plus 1 inch on the sleeve and 1 inch on the jacket. This is followed by another layer starting at the sleeve end and extending 1 inch on each side of the previous layer. *Figure* 104 illustrates the steps involved.

Splicing Conductors Of Plastic Jacketed Cables

LATER ON in this series, under the standard cable splicing procedures, the method of splicing together paper insulated conductors will be described. In the case of plastic to plastic jacketed cables or plastic jacketed to lead covered cable, the procedure is somewhat different. As in standard procedures for lead covered cables, the two conductor ends are cranked together to form 3 loose twists (half-turns) and 5-tight twists at the end. The loose twists at the neck of the splice permit equalizing of the tension in the different conductors within the splice bundle when the slack is taken out of the messenger strand and the cable and splice is fastened back on the strand.

Although the conductor splices in lead covered cable are generally not soldered unless toll circuits are involved, company practice may require soldering of the splices where plastic jacketed cable is installed. If this is the case, the last several tight

Kind of Cable Splice	Gauge of Conductors Spliced	Inside Diameter of Sleeve	Color of Sleeve
Straight	24 to 24	.125	Clear
Straight	24 to 22	.125	Clear
Straight	24 to 19	.125	Clear
Straight	22 to 22	.125	Clear
Straight	22 to 19	.125	Clear
Straight	19 to 19	.145	Red
Bridged	24, 24, 24	.125	Clear
Bridged	24, 24, 22	.145	Red
Bridged	24, 24, 19	.145	Red
Bridged	22, 22, 24	.145	Red
Bridged	22, 22, 22	.145	Red
Bridged	22, 22, 19	.145	Red
Bridged	19, 19, 24	.145	Red
Bridged	19, 19, 22	.165	Blue
Bridged	19, 19, 19	.165	Blue

Sizes of plastic filled sleeves.

turns in the splice are soldered with rosin-core solder.

In splicing plastic jacketed to the lead covered cables, plastic sleeves are employed to insulate the conductor splices as shown in *Figure* 105. The sleeve sizes are designated by a color code as follows:

Conductor Gauge	Sleeve Color and Diameters		
	Color	Inside	Outside
19	Red	.148"	.188"
22	Black	.125"	.168"
24	Green	.06"	.138"

An unique type of conductor sleeve (*Figure* 106) has been developed by Superior Cable Corporation for insulating conductor splices. These are plastic sleeves with one end closed and the body filled with a viscous or jelly-like plastic which retains its consistency at high or low temperatures. This material is designed to exclude moisture from the twisted conductor splice.

The conductors are twisted into a pigtail with 3 loose twists and 5 tight twists as in regular splicing except that the insulated part of the conductors are included in the three loose twists. The filled sleeves are slipped over the pigtail as shown in *Figure* 106.

The filled sleeves are 2⅛ inches long and are available in the sizes shown in the table at the top of this page.—***John S. Reed.***

Questions on Part V — Hot gas Welding Procedure for Ankoseal Cables; Precautions in Hot Gas Welding Splicing Procedure; Equipment and Materials for Hot Gas Welding; Setting Up the Hot Gas Welding Equipment; Procedure for Making Straight Splices; Method of Making Bridge Splices; Making Split Sleeve Splice; Additional Data on Ansonia Hot Gas Welding Equipment; Epoxy Resin Splices for Telephone Cable; Metal Splice Enclosures and Stubless Terminals; Tape Coverings for Cable Splices (Straight and Branch Types); Tape and Sleeve Covering for Splice in Lead Covered to Plastic Jacketed Cables; Splicing Conductors of Plastic Jacketed Cables.

(1) Describe the steps of the Ansonia hot gas welding procedure.

(2) What tools may be used in the hot gas welding procedure?

(3) The hot gas welding method is designed for cables with polyvinyl chloride jacket. What precaution must be observed if this method is used on polyethylene cables?

(4) Why does cast epoxy resin make a satisfactory splice covering? Explain how the resin covering is formed.

(5) Explain how a metal splice enclosure is used for a splice covering on telephone cable.

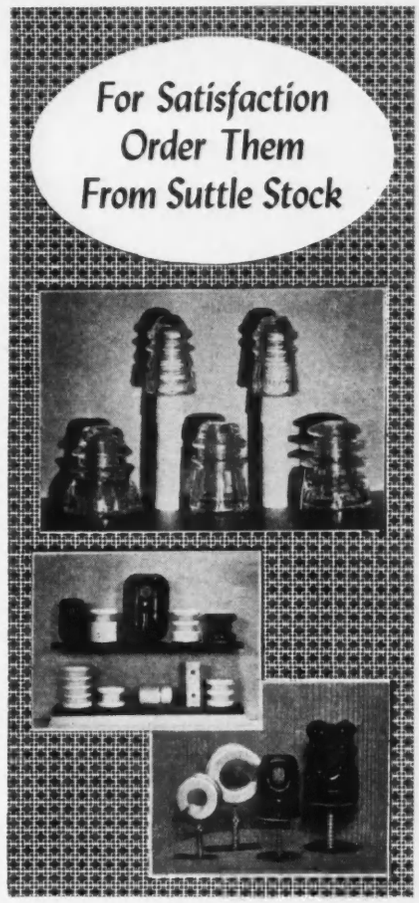
(6) What is a stubless terminal?

(7) What is claimed to be the advantage of eliminating the outside stub of a terminal?

(8) Give a brief description of how various kinds of plastic tapes can be used to produce a tight splice covering?

(9) How would you join lead covered to plastic jacketed cables, using plastic tapes?

(10) What kinds of conductor sleeves are now available for use in plastic jacketed cable splicing?



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A Practical Guide For Training Traffic Employes

By RUTH E. RICHARDS

SECTION V of Miss Richard's article discusses — (1) applying the seating plan; (2) securing absentee replacements; (3) administering reliefs; and (4) rearranging the force to meet unusual conditions.

Force Duties

THIS PART OF the Central Office supervisory job is, I believe, the most difficult to approach in a generalized outline, since the handling of force responsibilities is largely dependent upon local management policies. Specifically, such items as the responsibility for accepting reports of incidental absence, and the securing of replacement tricks for such absentee time.

In some exchanges such responsibility is deemed to be the Chief Operator's, while in other exchanges or companies such duties, as well as force records, are wholly delegated to other supervisory personnel, and in still others there is a sharing of the duties and maintenance of records between the Chief Operator and her supervisory force.

The course to be followed will be determined largely by circumstances, conditions, and precedent in individual exchanges. But regardless of where the responsibility rests, force administration involves all or part of the items to be covered in the following paragraphs:

Assuming that the operating schedule has provided for the required number of people on duty at the various periods throughout the day, it is necessary that they be arranged at the switchboard in such a manner that their work is most effective. To accomplish this result, an organized force assignment plan is used in larger offices. It provides a seating arrangement which assigns operators to

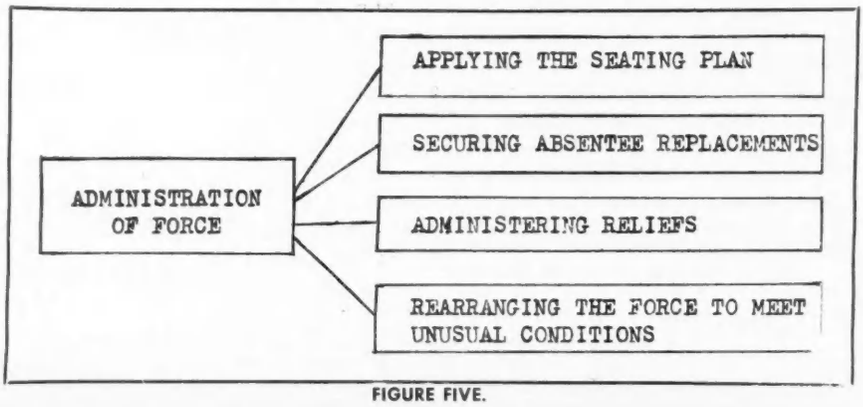


FIGURE FIVE.

particular positions and allows for distribution of experience and proper switchboard coverage. The smooth functioning of an office depends to a great degree upon the manner in which force administration is carried on.

In introducing the student supervisor to force duties, explain how the seating plan saves the time and confusion which results from having to direct each operator to a position each time she comes on duty; how it eliminates the task of keeping track of the time each operator goes on relief, and how many have been given; that it assures that operators will get off duty on time.

In smaller offices, even though seating plans may not be used, consideration given to the principles which govern good force administration will lighten the Chief Operator's work load. (In my company we recommend the provision of a seating plan where the busy hour coverage is five or more positions.)

Some of the responsibilities in connection with force work are:

(1) *Knowing who is assigned to work each day and whether they are present and at the right position.*

(2) *Arranging for the replacement of absentees.*

(3) *Obtaining additional force to meet service needs.*

(4) *When necessary, rearranging the force to meet service needs, for example, covering different positions at the same board, or moving operators from local to toll boards or vice-versa if traffic volumes exceed normal.*

(5) *Seeing that operators are relieved according to schedule.*

A weekly assignment plan of days off and replacement tricks provides:

(1) *The proper number on duty to meet variations in traffic by days.*

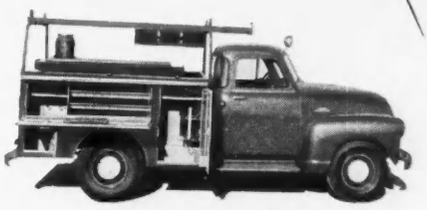
(2) *Assigns desirable days off and combination of days off so that everyone gets a fair share.*

(3) *Maintains a proper rotation of assignments on Sundays and holidays.*

(4) *Distributes the experience of the force by days.*

In teaching the student supervisor the force duties to be assumed by her, the instructor will explain the various forms and records to be used or maintained such as the:

(1) *Assignment of hours — Positions: Manner of showing lunch and relief periods; the various tricks used*



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THREE TELEPHONE PIONEERS from different sections of the country are shown here. They are Robert C. Price of Williamsport, Pennsylvania; Mrs. Marguerite T. Burns of Minneapolis, Minnesota; and Melvin F. Held of St. Louis, Missouri. Shown also are the emblems of the two Pioneer associations.

They're Telephone Pioneers

Experience and fellowship of long-term telephone men and women are important factors in good telephone service

Robert C. Price, Mrs. Marguerite T. Burns, and Melvin F. Held, shown together here, are Telephone Pioneers.

They are representative of the more than 180,000 men and women who belong to two big and important organizations in the telephone business.

These are the Telephone Pioneers of America and the Independent Telephone Pioneer Association.

These two organizations are composed of employees who have spent many years in the business, their average service being well over 21 years. About one out of every four telephone people in the Bell System and independent telephone companies in the United States and Canada is a Pioneer.

Each day the active, working Telephone Pioneers bring over 3¾ million years of "know-how" and experience to the job. Equally important is their spirit of service that is so important a part of the telephone business.

By sustaining and nourishing this spirit, they help to insure its continuance and provide a solid foundation for greater progress to come.

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BELL TELEPHONE SYSTEM

to meet requirements; and what the numbers, encircled numbers, etc., mean.

(2) *The form which shows the names of operators assigned to each trick, and who relieves them on days off.*

(3) *If a half-hourly count-of-employes-on-duty is maintained, this form should be explained.*

Review the procedures to be followed each time there is a change of force.

Supervisory responsibility in connection with relief periods:

(1) *See that the relieving operator plugs into the position before operator being relieved removes her plug.*

(2) *Observe that the correct procedures for relieving are followed — enter and exit at correct side of chair — avoid interference to service and adjacent operators.*

(3) *Check to determine whether the relieving operator changes her plug to the inside telephone set jack as soon as possible after being seated. Loss in transmission in outside jack — used only for relieving and monitoring.*

(4) *See that relieving operator promptly takes up her share of the work.*

(5) *Where connections remain on a vacated position, the supervisor should direct the operators on either side to give them the necessary attention.*

(6) *The seating plan is designed to meet average conditions, but where necessary the supervisor should rearrange seating to adjust for — absentees not replaced,* and *force experience not properly distributed.*

Movement of Traffic

MOVEMENT OF TRAFFIC is the term applied to that part of a supervisor's responsibility that pertains to the maintenance of a satisfactory speed-of-answer to line signals. To the average telephone user the promptness with which he is answered determines to a great degree his satisfaction with his service. The percent of answers which are over 10 seconds should be kept to a reasonable level at all times.

In some states the utilities regulatory bodies (Commerce Commission, Public Service Commission, etc.) establish a percent slow base which must be met if service is to be graded as satisfactory or acceptable. In my company we strive to meet the following objectives servicewise: Local Answers, 4.0%; Rural Answers, 4.0%; Toll Recording Answers, 8.5%; Inward Toll Answers, 3.5%. In other words, if not more than 4 out of every 100 local call answers are slower than 10 seconds, service is considered to be of a satisfactory grade, and other answers according to the objectives.

In smaller toll center offices, where Service Observing is not carried on with specialized equipment, it is possible to maintain a continuing check upon speed of service through stopwatch observations of the various types of signals. These observations may be taken by supervisors as part of the duties of floor work. This is the method used in the exchanges served by my company.

To insure that satisfactory answers are being given, the supervisor will watch for the following items:

(a) *That operators are prepared to answer signals by being attentive and having a cord and associated key in position to answer when not performing other work. That she has drawn the cord straight toward her with the hand resting on the edge of the keyshelf and with the tip of the plug pointed toward the keyshelf. The other hand, if not in use, should rest on the edge of the keyshelf. Cords held in this manner will not obscure the supervisory signals.*

(b) *That operators are encouraged and trained to keep in mind the order of appearance of signals and to answer them in that order. If more than one line signal is lighted at one time, they should answer the signal that appeared first.*

(c) *That operators are answering line signals while relieving other operators and are not waiting to be completely seated before answering a signal.*

If a customer fails to give an order on the second "Number, please?," the operator should change to the front cord of another pair and say, "Number, please?" again. If she still receives no response, she may be instructed to proceed as follows:

(1) *If the operator knows that the line is an individual or PBX line, she should hold it for about one minute, then at frequent intervals she should challenge and if she receives*

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no response she should ring on the line, meanwhile supervising carefully for an answer. (2) *If the operator knows that it is a party line, she should cut out and proceed with other work, and watch for a flashing signal.*

(3) *At the end of two minutes, if she has not received a signal or an answer, she should challenge on the line again. If she receives no response she should report the line as a permanent signal and handle according to local methods.*

To improve speed of service and encourage teamwork, each operator should be encouraged and developed (if need be required) to assume her fair share of the load.

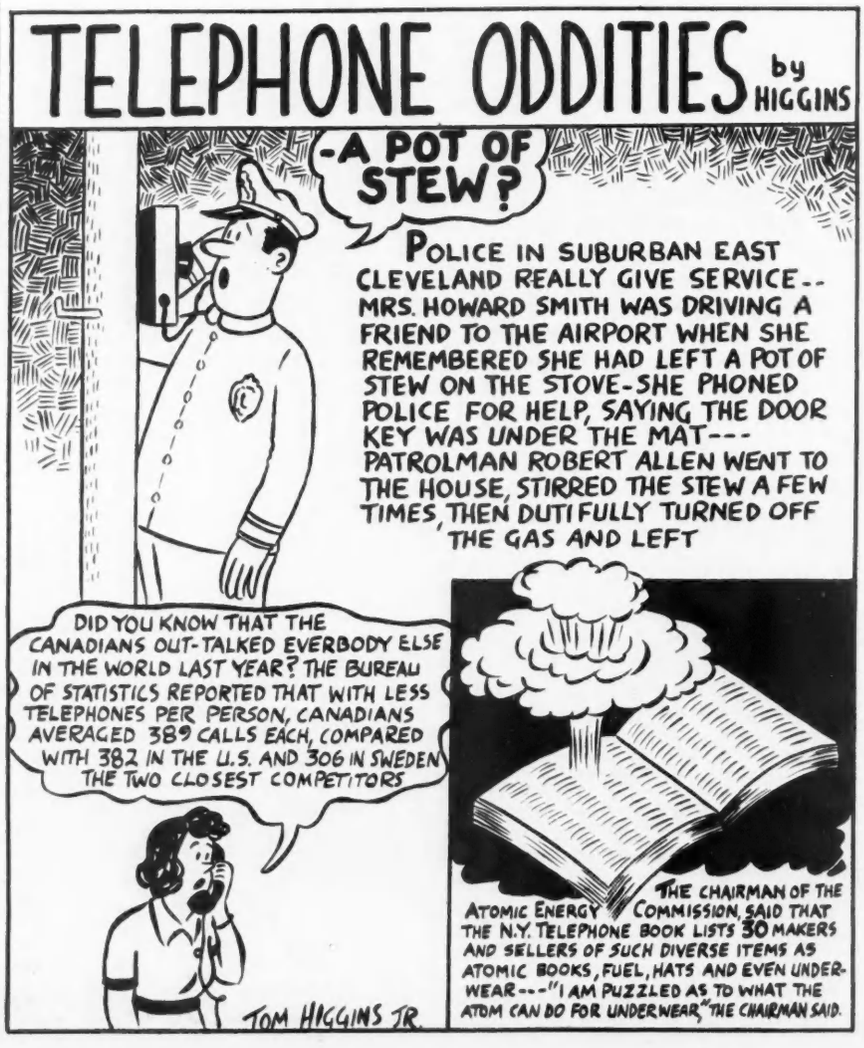
Order of Attention to Signals

AN OPERATOR'S first responsibility is attention to signals and the supervisor will be alert to see that she understands why certain signals are given preference over others, and the order of preference:

(1) *Connection to be Timed.* (Where certain toll calls or area service calls are timed by local operators) the beginning and the end of conversation must be noted as promptly as possible. Generally it is possible for the operator to perform other work while she is doing this as, for example, by reading the clock at once even though her hands will not be free to write for a few seconds; but the operator should understand that accuracy of timing is of primary importance and not permit other work to interfere with it.

(2) *Flashing Supervisory Signal from Customer.* This signal indicates that the person flashing wishes to talk with the operator regarding the call or to make a new call. Since, the operator is holding his line on a cord at her position she is the only operator he can signal. She should, therefore, give him prior attention over line signals which can be answered by other operators.

(3) *Disconnect Signal Requiring Challenge.* A signal indicating that the called station has hung up, but that the calling party is still on the


TELEPHONE ODDITIES by HIGGINS
-A POT OF STEW?
POLICE IN SUBURBAN EAST CLEVELAND REALLY GIVE SERVICE-- MRS. HOWARD SMITH WAS DRIVING A FRIEND TO THE AIRPORT WHEN SHE REMEMBERED SHE HAD LEFT A POT OF STEW ON THE STOVE-SHE PHONED POLICE FOR HELP, SAYING THE DOOR KEY WAS UNDER THE MAT--- PATROLMAN ROBERT ALLEN WENT TO THE HOUSE, STIRRED THE STEW A FEW TIMES, THEN DUTIFULLY TURNED OFF THE GAS AND LEFT
DID YOU KNOW THAT THE CANADIANS OUT-TALKED EVERBODY ELSE IN THE WORLD LAST YEAR? THE BUREAU OF STATISTICS REPORTED THAT WITH LESS TELEPHONES PER PERSON, CANADIANS AVERAGED 389 CALLS EACH, COMPARED WITH 382 IN THE U.S. AND 306 IN SWEDEN THE TWO CLOSEST COMPETITORS
THE CHAIRMAN OF THE ATOMIC ENERGY COMMISSION, SAID THAT THE N.Y. TELEPHONE BOOK LISTS 30 MAKERS AND SELLERS OF SUCH DIVERSE ITEMS AS ATOMIC BOOKS, FUEL, HATS AND EVEN UNDERWEAR---"I AM PUZZLED AS TO WHAT THE ATOM CAN DO FOR UNDERWEAR," THE CHAIRMAN SAID.
TOM HIGGINS JR.

EDITOR'S NOTE

If you have a subject you would like for Miss Richards to discuss in a future article, drop us a line. We'll pass your suggestion along to Miss Richards.

line, may mean a slow disconnect or it may mean that the calling party wishes to make another call. The operator on whose position the signal appears is the only one who can learn what the customer wants. Reasonable prompt attention from the operator frequently prevents a customer from flashing, and an immediate answer is in order if he is flashing.

(4) *Line Signal*

(5) *Disconnect Signal not Requiring Challenge.* While this type of signal is listed last, prompt disconnecting is important and should be performed as an overlap operation.

The instructor's lesson outline for "Movement of Traffic" will list the following items to be emphasized as important factors in the speedy and accurate handling of calls:

Local Traffic: Alertness in watching for signals.

(1) *Prompt cord pick-up — skillful cord handling — equal dexterity with either hand.*

(2) *Rapid advancement of cords — associating and tracing cords.*

(3) *Immediate first ring and supplementary rings of proper duration and spacing, if automatic (machine) ringing is not provided.*

(4) *Thorough knowledge of line and trunk multiples — observance of preferential markings, and multiple markings.*

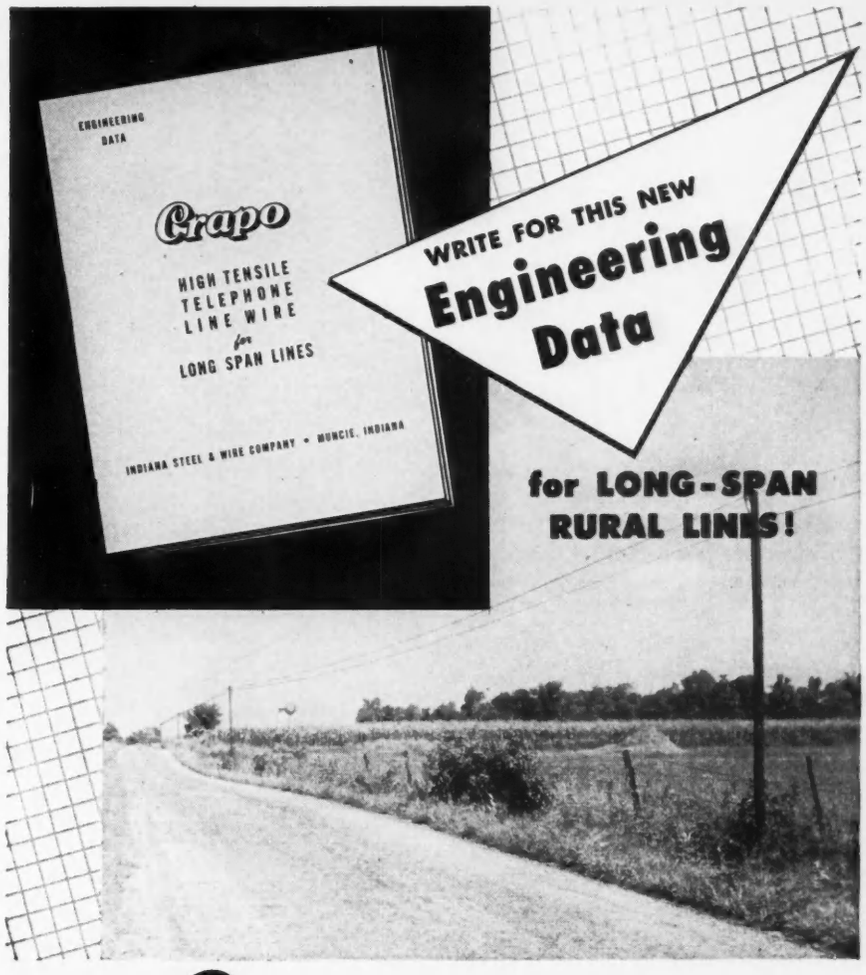
(5) *Waiting a suitable interval for a response before using another trunk.*

(6) *Correct technique in operation of keys, dial, etc.*

In our next lesson we will conclude the series of service items covering Movement of Traffic and clear the stage for the next feature, which will be the training phase of supervisory work. Be seein' ya. — ***Ruth E. Richards.***

Kansas Co-op Will Purchase Six Exchanges

THE KANSAS Corporation Commission has authorized the Rainbow Telephone Co-operative Co., Inc., to buy six small telephone exchanges in Atchison, Brown, and Doniphan counties and install a dial system.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Questions and ANSWERS

Conducted by Jay G. Mitchell

***IN THIS INSTALLMENT** of his popular department Mr. Mitchell discusses — (A) A wider field for a more sensitive instrument in measuring DB, and (B) Testing transmitter output in the shop.*

QUESTION: — *In the series on the Decibel Calibration the graph and tabulations published apparently cover the most often encountered conditions. We fail to find much data applicable to, for illustration, 20 Dbm, or over 8.0 volts A. C. Can you publish some data which will extend into the A. C. Voltages over about 10. If so it would be very much appreciated by some of us who are very much interested. We have recently acquired a multitester which has several A. C. Voltage ranges in all of which the manufacturer claims a sensitivity of 10,000 ohms per volt. We have been using this instrument to measure Decibels by reading the volts and then converting to Decibels. A table covering the A. C. Voltages over those published would, it appears, be of value.*

ANSWER: — The material, since it was related in the beginning to the multitester type of meter, has been confined to the probable ranges in which that type of instrument would probably be of the most value.

VOLTS IN LOOP OF 600 OHMS IMPEDANCE, VS. DECIBELS (Dbm.)

A.C. Volts	Amperes	Watts	Ratios Power	Volts	Sign	Dbm.
70.0	0.1160	8.166	8166.67	90.91	plus	39.12
60.0	0.1000	6.000	6000.00	77.92	plus	37.78
50.0	0.0830	4.167	4166.67	64.93	plus	36.20
40.0	0.670	2.667	2666.67	51.95	plus	34.26
35.0	0.0580	2.042	2041.67	45.45	plus	33.10
30.0	0.0500	1.500	1500.00	38.96	plus	31.76
25.0	0.0420	1.042	1041.67	32.46	plus	30.17
24.495	0.0410	1.000	1000.00	31.81	plus	30.00
24.0	0.0400	.960	960.00	31.17	plus	29.82
22.0	0.0370	.807	807.00	28.57	plus	29.07
20.0	0.0330	.667	666.67	25.97	plus	28.24
18.0	0.0300	.540	540.00	23.37	plus	27.32
16.0	0.0270	.427	426.67	20.78	plus	26.30
14.0	0.0230	.327	326.67	18.18	plus	25.14
12.0	0.0200	.240	240.00	15.58	plus	23.80
10.0	0.0160	.160	166.67	12.99	plus	22.22
8.0	0.0130	.107	106.67	10.39	plus	20.28
6.0	0.0100	.060	60.00	7.79	plus	17.78
4.0	0.0067	.027	26.66	5.19	plus	14.26
2.0	0.0030	.007	6.66	2.59	plus	8.23
0.77	0.0013	.001	1.00	1.00		0.00

CONVERSION TABLE — A. C. Volts To (Positive) Dbm.

However, the type of instrument described in this inquiry can be useful in a wider field of electrical testing than a less sensitive instrument. In answer to this inquiry, therefore, there are published in this issue two tables for higher voltage conversion. One table is for Db, and one for Dbm. While this inquiry reaches into fields not open to the ordinary type of instrument it may well be found to be of the greatest value to this telephone company.

VOLTS IN LOOP OF 500 OHM IMPEDANCE, VS DECIBELS

A.C. Volts	Amperes	Watts	Ratios Power	Volts	Sign	Db.
70.0	0.1400	9.800	1633.333	40.462	plus	32.13
60.0	0.1200	7.200	1200.000	34.682	plus	30.79
50.0	0.1000	5.000	833.333	28.901	plus	29.21
40.0	0.0800	3.200	533.333	23.121	plus	27.27
35.0	0.0700	2.450	408.333	20.231	plus	26.11
30.0	0.0600	1.800	300.000	17.341	plus	24.77
25.0	0.0500	1.250	208.333	14.451	plus	23.19
24.0	0.0480	1.152	192.000	13.872	plus	22.83
22.0	0.0440	.968	161.333	12.716	plus	22.08
20.0	0.0400	.800	133.333	11.561	plus	21.25
18.0	0.0360	.648	108.000	10.405	plus	20.33
16.0	0.0320	.512	85.333	9.248	plus	19.31
14.0	0.0280	.392	65.333	8.093	plus	18.15
12.0	0.0240	.288	48.000	6.936	plus	16.31
10.0	0.0200	.200	33.333	5.780	plus	15.23
8.0	0.0160	.128	21.333	4.624	plus	13.29
6.0	0.0120	.072	12.000	3.468	plus	10.79
4.0	0.0080	.032	5.333	2.312	plus	7.27
2.0	0.0040	.008	1.333	1.156	plus	1.25
1.73	0.0035	.006	1.000	1.000		0.00

CONVERSION TABLE — A. C. Volts to (Positive) Db.

QUESTION: — *In a recent issue a method of checking the condition of repaired telephones, especially as to the transmitter, by reading the output volts of the instrument was very briefly outlined. In our shop the suggested plan is being used with very satisfactory results in the case of local battery telephone instruments. The application of the suggested method to the checking of Common Battery telephones has not proved to be satisfactory however. The difficulty arises*

when the Common Battery telephone is placed under test because the meter pointer swings very erratically, covering a range away outside of the instrument scale. No doubt the explanation is very simple but we have not yet been able to use our Common Battery testing setup for the reason stated. Can you explain the matter so that we can correct our error as it seems to be a very important method of giving the telephones an overall test before replacing them in service. Under this condition we are very anxious to test all repaired instruments, Local Battery as well as Common Battery by this overall method to save time.

ANSWER: — The testing setup, very briefly outlined in a recent issue, was entirely too general. In the repair shop it is, of course, advisable to check the overall performance of all telephones before placing them in stock for use. This overall test can very readily be made without requiring much time by placing the instrument in a test circuit which is electrically identical with normal service operating conditions and then observing, among other things, its *transmission output at voice frequencies. Transmission output* may be defined as the alternating current power at voice frequencies that the instrument produces when sound waves of the voice are impressed upon the transmitter diaphragm. In telephone transmission this (transmission output) is customarily expressed by Decibels. The series on the Decibel calibration should include a brief discussion of the matter because of that fact. It is to be noted, however, that transmission output is conventionally related to the alternating current *power* at voice frequencies given out, under reasonable normal working conditions by the equipment under test.

Because there are so many different Central Office connecting circuit arrangements in use (cord circuits in manual equipment and trunk circuits in mechanical switching plants) it is impractical to supply this company with a sketch of a testing circuit with any assurance that it could be used without modification elsewhere. For that reason the principal features of such a set-up will be briefly described. Each wire chief installing such a circuit for the use of the repair shop can easily adapt the local facilities to the purpose if needed.

For testing the output of telephone instruments (voice frequency transmission).

(a) Establish a testing circuit electrically equivalent to the standard magneto cord circuit. The telephone under test to be connected to one termination and the Decibel Meter or A. C. Voltmeter to be connected to the other.

(b) Provide a double pole double throw key or switch so that either a standard magneto ring off drop or a standard Common Battery cord circuit battery feed may be connected, at will, to the test circuit, between the telephone and the condenser.

(c) Insert *in series* in each side of the test circuit (in the tip side and in the ring side) one 2 microfarad condenser.

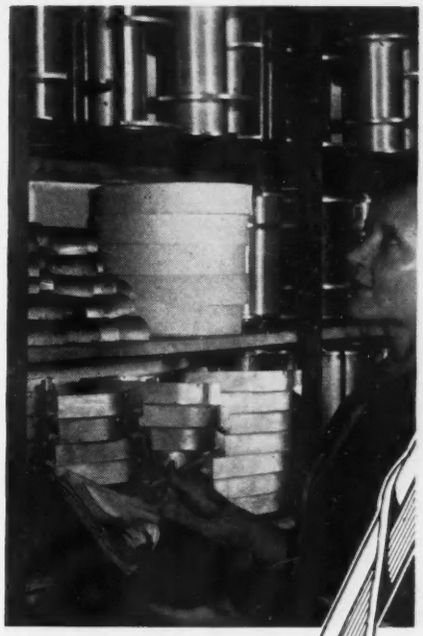
(d) Insert *in series* in each side of the test circuit (in the tip side and in the ring side) one 100 ohm non-inductive resistor between the telephone terminal and the 2 microfarad condenser.

(e) Insert *in series* in each side of the test circuit (in the tip side and in the ring side) *one* 100 ohm non-inductive resistors, between the terminal for the Decibel Meter or the A. C. Voltmeter and the 2 microfarad condenser.

(f) Connect *across* the test circuit *with* the Decibel Meter or the A. C. Voltmeter one 200 ohm non-inductive resistor.

The telephone may be tested with such a circuit, or the equivalent, by talking into the transmitter and observing and *recording* the reading of the Decibel Meter or A. C. Voltmeter, the key or switch of the test circuit being *in the proper position* for the type, Common Battery or Magneto, telephone under test.

It is to be noted that the results obtained are *relative only* unless especial care has been taken to incorporate such components into the test circuits as will produce results that are standard. For the same shop and the same company *relative standards* are very satisfactory. This subject is of the greatest importance and if the suggested method is not clear QUESTIONS AND ANSWERS will appreciate another opportunity to be of help in the development of telephone quality by this method.—***Jay G. Mitchell.***



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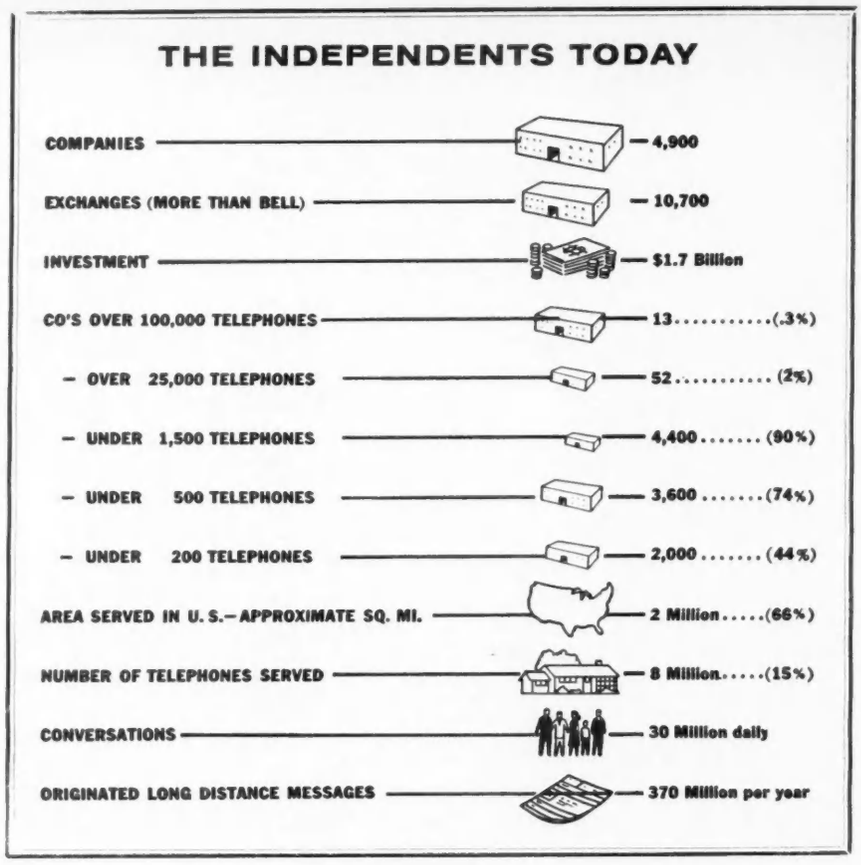
Small Company Talk

By BILL CORMAN


THE INDEPENDENTS TODAY
COMPANIES — 4,900
EXCHANGES (MORE THAN BELL) — 10,700
INVESTMENT — $1.7 Billion
CO'S OVER 100,000 TELEPHONES — 13.....(.3%)
– OVER 25,000 TELEPHONES — 52.....(2%)
– UNDER 1,500 TELEPHONES — 4,400.....(90%)
– UNDER 500 TELEPHONES — 3,600.....(74%)
– UNDER 200 TELEPHONES — 2,000.....(44%)
AREA SERVED IN U. S.– APPROXIMATE SQ. MI. — 2 Million.....(66%)
NUMBER OF TELEPHONES SERVED — 8 Million.....(15%)
CONVERSATIONS — 30 Million daily
ORIGINATED LONG DISTANCE MESSAGES — 370 Million per year

"WHEN COMPANIES begin to get into the one-to-five thousand station range they run into some new problems — but mostly the emphasis is different on the old problems that still tag along to make things more interesting than ever."

HI, NEIGHBOR! As is indicated by the title under which these articles appear, what we talk about usually is the small telephone company. At various times, however, the question arises as to what is a small company.

People ask me, "Is what you wrote in such-and-such an article intended to apply to me?" And what they are getting at by such a question is whether or not they are a small company as it was thought of in that article.

Frankly, I don't know what a small company is, but there is one phenomenon which pretty well holds true. Most Independent owners consider themselves as Small Companies. A few of the bigger Independents do not so consider themselves, but only a very few. My guess would be that any Independent telephone company which has less than perhaps fifteen to twenty thousand stations considers *itself* small, because, when compared to a number of other telephone companies and systems, that really *is* small.

On the other hand, the man with 500 stations is considered big by the man with 50, and the man with 500 stations considers only a company of 5,000 as big. Everybody, in other words, relates "bigness" to his own present size, and, until he gets possibly upwards of 20,000 stations, he considers himself "small," regardless of what others who are smaller think.

In looking back, I find this is true with my articles. When I started this series a few years ago, I mostly wrote about really small companies, say under 500 stations, because that's the size we were then. As we grew — we are now above 2,400 — my idea of a small company grew accordingly, and my articles have reflected it.

I have gradually been writing about larger and larger companies as being "small." I don't believe this has been misleading however, for practically all of the problems of a company with 400 or 500 stations will also apply to a company of from one to three thousand, and my only reason for bringing the point up at all is that this present series of articles is frankly pointed principally at the group of companies with from say one to 5000 stations. At the same time, the ideas we will talk about are of prime interest to the small and to the very small operators, and the reasons for this will develop as we go along.

The Management Problem

WHEN COMPANIES begin to get into this one-to-five thousand range, they may run into some new problems that they didn't have before, but mostly the emphasis is different on the old problems that still tag along. For convenience, let's call these one-to-5000-station companies, *medium* sized.

An example of what I mean by the emphasis being different is the management problem. The management problem is with us from the time we go into business with what ever number of stations we start with, until we are as big as Bell, if any of us ever get that big. But in the company with under 200 stations, the problem is one of getting enough gross revenue

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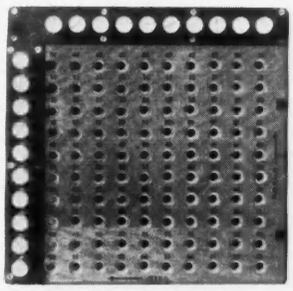

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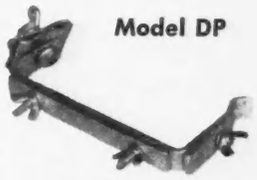

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This dual purpose clamp will hold the Terminating Board ar the Meter Unit at any angle, above or bleow the strand, for convenience during use.

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Controlled Quality

From the pine forests of the Southeast to the outbound loaded car, each step in Taylor-Colquitt pole production is subject to precise and accurate control.

These controls cover timber selection and pole manufacture as well as moisture removal and preservative treatment. Developed and refined during the 29 years that Taylor-Coltquitt has been a producer of fine poles, they assure uniform high quality and consequent maximum life.

For poles with "controlled quality" specify Taylor-Colquitt treated pine.

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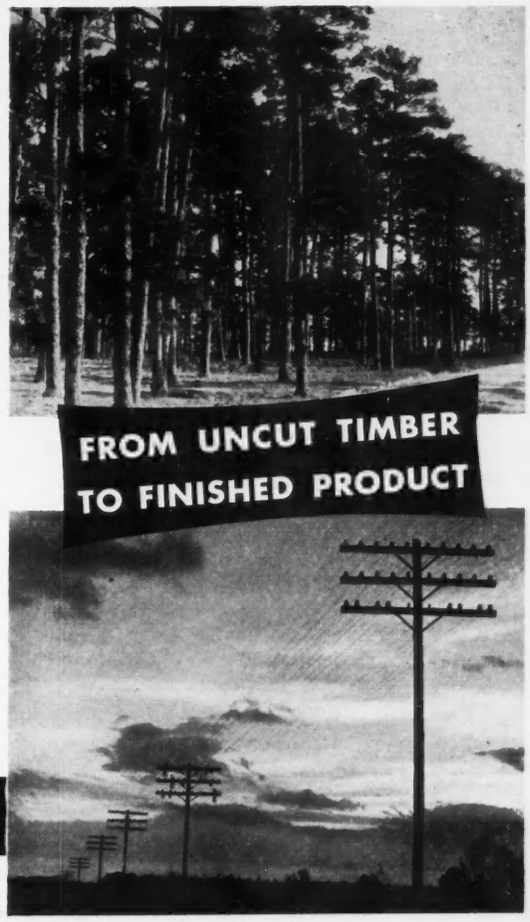


TAYLOR - COLQUITT CO.
SPARTANBURG, SOUTH CAROLINA

Plants at Spartanburg, South Carolina and Wilmington, North Carolina

to hire any kind of management at all, or if the owner is the manager, paying the owner enough for him to justify spending his time in the telephone business.

REA officials say very frankly that this management difficulty is the principal one in the way of making loans to very small companies — there simply is not enough gross revenue to pay proper management. Somewhere upwards from the 300 station mark, the exact figure depending upon any number of factors, the gross revenue becomes large enough to hire proper management. From 300 to about 1000 stations, the problem is largely one of the manager doing less and less detailed work and more and more actual management, but the company by and large stays in the one-man-management category.

And now we come to the *medium* company, and a further shift in emphasis on the management problem. Somewhere upwards of 1000 stations, again depending upon a number of factors and the exact figure varying widely from company to company, the medium company begins to run out of management again — there is too much actual managing for one man to accomplish. The problem is still one of management, but the emphasis changes radically. For at this point in a company's development, a whole new management concept must be brought into effect.

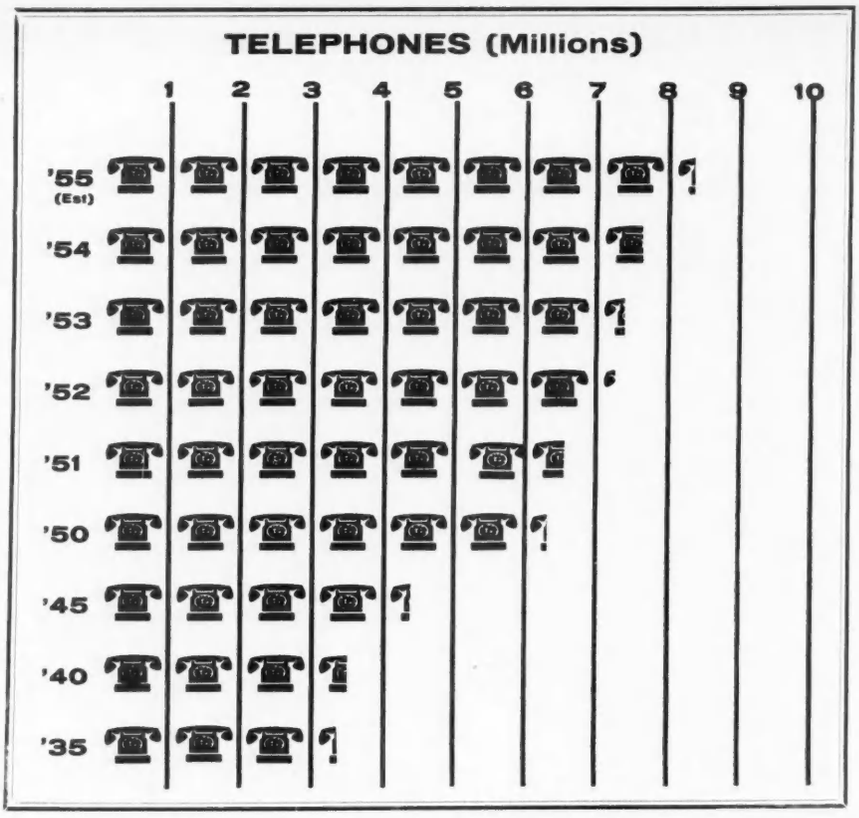
Perhaps it would be wise, at this point in the discussion, to define broadly what I mean by management. While it is not altogether correct, a simple and rather useful definition of a management person is one with the authority to make decisions, and in this discussion that is the principal meaning I am attaching to the word.

When a telephone company gets into the medium range it must at least begin to make the transition from *one-man* management to *staff* management. For any number of reasons that is a difficult transition to make.

Management is hard to find. It is no harder to find at one stage than another, but this transition period is simply one of the times when it must be found.

Lack of adequate gross income to hire the staff needed again comes into force as a difficulty of the first magnitude.

The existing management must first learn how to, and second actually accomplish, a proper delegation of authority — and this is a most difficult process for some people.



The Independent telephone industry operates about 8-million telephones through 11,000 central offices. — *(Bell Telephone Magazine.)*

Some people who have been pseudo-managers — that is, people who have been doing jobs that management people ordinarily do but who have not had the authority to make the decisions in those jobs — are also in for a change. They must either be elevated to actual decision-making management, or new managers must be put in over them to make the decisions. Either way, in many cases, it is a disquieting period.

Red tape invariably starts piling up — where one copy used to suffice, now it takes several so that all the departments can be coordinated. Clearance on certain questions must be had from several department heads, rather than from the one-man manager, who did all the considering in his head and didn't have to discuss it with anyone.

Processes begin to change all the way along the line. Labor reporting and accounting techniques may well change. Budgeting becomes more formal, more complicated, and more important. Accounting, statistical, service, and other forms change in content, routing, meaning and usefulness. Much must now be written out that was before carried in the heads of several people. Conferences and coordinating become necessary. And you can finish out the rest of the long list as well as I. The point here is not to detail the difficulties so much as it is to point out that this, in many more ways than one, is not an easy time.

The Transition Stage

IN THIS transition stage from the small company to medium sized, or from the one-man to the staff-type management, or whatever you want to call it, it is important that the management of the company first of all *realize* that a transition is taking place, and second, to grasp, think about, and *do something* about the shifted emphasis in almost every problem.

The shifted emphasis on the management problem, we have discussed briefly already.

There is a shift in emphasis also in financing. Whereas in a small company, the principal problem may be *where* it can get money, in a medium company, it may well shift over to the *cost* of getting the money (interest rates, etc.). And whereas the small company probably thought almost exclusively in terms of debt financing, the medium company must

begin to consider equity financing in addition to debt.

There is a gradual, mostly almost imperceptable, shift in the public relations problem. Management people in small companies know very well that their close relations with friends and neighbors (who are also customers) is good public relations. They know too that personal attention to little problems of their customers, attendance at civic meetings, stopping to talk to acquaintances on the street, and all the other activities of small town life, are just about as good a public relations program as they can have. But as the company gets larger and larger, the percentage of your customers with whom you can be on a personal friendly basis gets lower and lower. And so the emphasis must shift more and more to advertising, public relations efforts by employes, bill inserts, and other devices that, as far as the manager is concerned, may be said to be impersonal.

There is likewise a shift in employe relations. In the small company, everybody probably sees everybody else several times a day, including the manager. Little questions, short words of appreciation, a joke, a comment about how something is bad, or good, or could be made better — these pass between management and employes naturally and without plan, effort or thought. As the company grows, this changes. Unless thought is given, the management employes may well grow away from each other in direct relationship to the growth in size of the company.

There is a shift in emphasis on accounting. Although I have argued that, even in very small companies, it should be something more, I know that in most cases small company accounting is regarded as a necessary evil, and that about all that most small companies want from accounting is for the customers to get charged (and collected from), the bills to get paid, and the taxes to get figured out.

And where it is possible (though I still argue not profitable) for the small company to think of accounting only in these terms, the medium sized company must begin to consider accounting in a new light—as a primary and basic and highly important tool of management. Almost every management decision is, in the final analysis, rooted in the bottom line of the Income Statement. And all of the myriad figures that go into or have effect on that bottom line figure, are relatively important.

The accuracy of these figures, what they mean, where they are trending, what their cause was, what their effect will be — these become things that attention must be given to if management is to control the company, and the company not to control management.

Again, you can probably add to this list of ways in which the emphasis on problems shifts as the company grows from small to medium. All along the line the problems are still there, but they are now sneaking up to hit you from a different direction. To realize that you are in such a spot, and to look in the right direction and get your guard up before they hit you, is a necessary part of management at this stage of growth.

In future articles, we will delve again into some of these situations.—*Bill Corman.*

"What It Means To Be Telephone People"

WE TELEPHONE people travel an unusual road. In a nation where big business and little business drive down a fast, competitive highway, we have been leased a private way. To us the people of the nation have singularly granted a trust and a power.

In the Bell System there are more than half a million of us, serving twenty-five million customers. On our shoulders alone is the responsibility to give these people the round-the-clock, dependable telephone service they need. In our hands is a power to bind them together in friendship, trust, and common understanding.

Over our switchboards go their hopes, their fears, their sorrows, their needs. Across our lines they order groceries from the corner store, close business deals, make appointments, send tidings of births and deaths. With our help they summon doctors when they're sick, policemen and firemen when they're in trouble. We have taken part in the shaping of the law, the progress of commerce, the growth of schools, and the courtship and marriage of two generations.

Since the birth of the industry, telephone men and women have dedicated themselves to the fulfillment of this our public trust. They have developed within themselves and the telephone team a spirit of service and helpfulness that has surmounted fire, flood, and disaster. They have handed down to us a heritage rich with their courage, their loyalty, and their devotion in rendering a service to the people.

We, the telephone people of today, are vested with the responsibility of carrying on this trust. We will make mistakes, for it is human to err. But in the long run, how we do our individual job, how we bear our individual responsibility, will determine how we achieve our trust. For in the last analysis we do not work for the telephone company. We are the telephone company.—*Bell Telephone Magazine.*

"Two hints for making any day more pleasant—Think and Thank."

construction and maintenance DIGEST

- **Insure your power**
- **Lightweight champ**
- **Ringer wins for you**
- **Grounding to pipe**
- **Profitable noise**

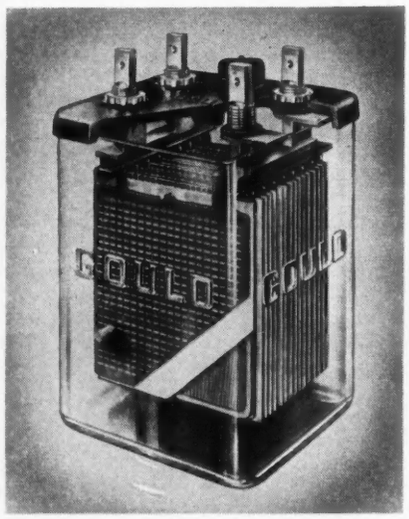
Published every month to help you get the most out of your materials and supplies dollar

by C. J. Reynolds, Stromberg-Carlson Company

The few dollars you spend on *reliable* equipment today will be repaid a hundredfold in lower maintenance costs for years to come. Protect your investment with the double guarantee offered by Stromberg-Carlson. First, leading manufacturers build this equipment, and guarantee it. Second, because we recommend and sell this equipment to the telephone industry, we *also* guarantee its performance!

Insure your power supply

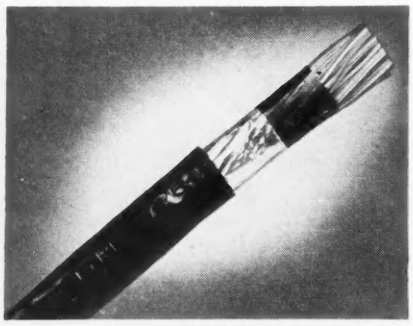
Because Planté batteries practically last forever...providing standby power that never fails...they're the best operating insurance you can buy. In switchgear, signal and alarm systems, or emergency light and power applications, these lead batteries have rolled up amazing performance records . . . are famous for their ability to deliver a powerful surge or a steady flow of current the instant it's needed. Make sure you're in operation . . . always. Choose Gould Planté.



A sure, dependable supply of power when you need it. That, briefly, is the story of this Gould Planté battery.

Here's easy-handling cable— Aerial, burial or tucked in a duct

You can cut installation and handling costs, save yourself a lot of time, with Ankoseal lightweight plastic cable.



Polyethylene insulation and special jacket compound of this cable give plenty of protection.

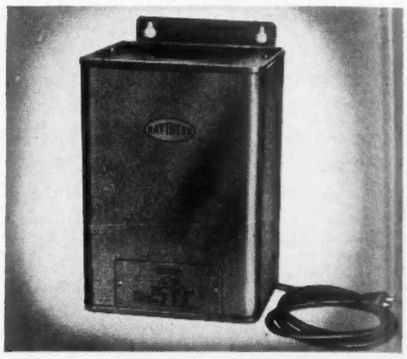
It has polyethylene insulation that gives you excellent moisture resistance and thereby eliminates the hazard of wet cable. Another advantage of polyethylene is its high dielectric strength, which means less lightning trouble.

And to give you an unbeatable protection from weather, the Ankoseal 454 jacket compound is used. This special formula not only shrugs off climatic conditions, but also resists corrosion, electrolysis and vibration cracking.

Ankoseal lightweight plastic cable is made for aerial (both messenger and self-supported), for duct and for direct burial installations.

How to get humless DC *and* 20-cycle ringing in one unit

In a case that's just barely big enough to carry a husky lineman's lunch, you can get plenty of power.



Both battery eliminator and 20-cycle ringer are combined in one small unit, providing 1 ampere, 24 volts.

We're talking about the Raytheon RectiRingeR*, which measures only 7⅜" x 12¾" x 6". Here, in one compact little unit, you get **both** a battery eliminator and 20-cycle ringer.

This unit includes the RectiFilteR*, the DC power source that has been proven by years of service for Independent telephone companies. It supplies humless, regulated DC power, with 20-cycle ringing power.

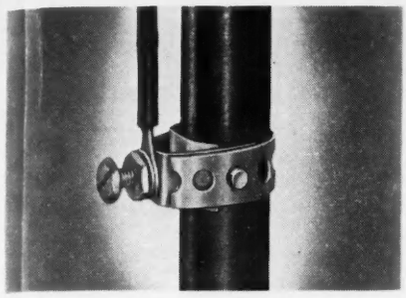
Economical, silent in operation, the RectiRingeR is easy to install. And it has a special relay which **instantly** brings in "stand-by" power in the event of an AC failure.

*Reg. U. S. Pat. Off.

Want a good station ground for ⅜" to 1¼" pipe?

For all telephone, radio and signal circuit station grounds, here is a clamp with a tighter grip than a blonde clinging to a sailor's arm.

It's made by Reliable Electric Company, and has design principles which have been proven in the field to maintain high-pressure contact and maximum conductivity to the joint. This vise-like grip gives you the dependable grounding you need.



Station ground clamp is adjustable for grounding to water pipe, gives maximum conductivity to joint plus high-pressure contact.

The Reliable station ground clamp is for ⅜" to 1¼" pipe, easily adjusting for any size in that range. It is made of tinned copper strip. The screws and nuts have close-fitting threads.

Noise can be money!

Take a business subscriber who has a telephone in some extremely noisy location—and who has finally decided to do something about it. Would you rather have him spend money in building a soundproofed booth—or give **you** the money as monthly income on a telephone which completely licks the noise problem?

The GAI-PHONE is such an instrument. It has a special transmitter that actually creates a "Zone of Quiet" around the handset—even in a spot as noisy as a boiler factory!

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Part-Timers Can Reduce Costs

By PHIL GLANZER

MANY COMPANIES overlook the cost-saving factors involved in the use of temporary or part-time employes. The temporary or part-time worker can be the basis of a quickly trained and highly efficient force, providing proper techniques of selection are used.

The temporary worker is brought in for a few days to meet heavy workloads without putting permanent additions on the payroll. The part-time worker comes in at the time he is needed most, spends concentrated effort for a few hours each day on his assignment, and departs. His work period is uninterrupted by breaks, lunch hours, employe meetings, etc. The paper work and records involved in the full-time employes are considerably reduced.

When the temporary worker's assignment ends, he expects to be laid off; does not create the over-staffing problems of a full-time employe. Such assignments as end-of-month paperwork, rush orders, seasonal or week-end business, special mail or sales promotions, special events, etc. are types of short-term assignments where the temporary employe can be used effectively, without adding to the full-time personnel overhead.

Adequate Supply

THE SUPPLY of temporary and part-time workers is reported as an adequate one, and the usual recruitment methods such as newspaper advertising, notices to present employes, high-school and college placement bureaus, state employment bureaus, state employment offices, etc., are generally effective in attracting an adequate supply of applicants. The selection problem, if approached scientifically, can spot the rapid learners and high producers. Three selection techniques, all company-administered, are recommended:

(1) *Short Application Blank*: A half-sheet form, asking questions on age, education, marital status, information on last three jobs, special skills, availability. This blank can be easily designed by the company personnel department, and should not require more than five minutes for the applicant to complete.

(2) *Short, 5-Minute Interviews*—To review the application-blank information, and to size up the applicant generally in terms of the standards required for a temporary employe (lower standards in terms of background, maturity, and stability, than a full-time worker).

(3) *Aptitude Job-Tests*: —To see that the applicant has the necessary mental abilities to learn the assignment quickly and perform it efficiently. Correct aptitudes for the part-time job are actually the crux of efficient use of the temporary employe. The tests take 15 to 30 minutes to give to one or a number of applicants, and are administered and scored by the company's personnel department. Cost of the tests average $1.00 per applicant.

The prime advantage of the personnel test is that it measures abilities which are directly related to the job assignment, and many of the aptitudes which can be tested cannot be spotted in a face-to-face interview discussion. The applicant's score is expressed as a qualification level (underqualified, minimum-qualified, well-qualified, best-qualified, overqualified).

Temporary employes should be well——, best——, or over-qualified; NEVER under—or minimum-qualified. The overqualified applicant is often a very good risk for a temporary job, since he learns quickly and the assignment is over before he can become bored.—***Phil Glanzer.***

NEW EQUIPMENT and NEW METHODS

By John G. Reynolds

NYLON SAFETY STRAPS standardized by Bell System . . . New chemical principle aids vegetation control . . . Latest innovation in common carrier mobile radio-telephone service started in Baltimore . . . New crimp-type connector.

Linemen Wearing Nylons Now

THEY SAY THAT men's fashions never change, but they do. At least they change in the telephone business, especially when a safer, more durable, and more economical material is found. That's why linemen are wearing nylons today.

According to *Wisconsin Telephone News*, this latest "Look" is in safety straps, the life line for men who spend a great deal of each working day some 20 or more feet in the air supported by this accessory.

Wisconsin Telephone Co., in cooperation with the A. T. & T. and a midwestern manufacturer, pioneered in the testing of this new fashion and found it so practical that it is now standard equipment throughout the Bell System.

During the tests, the new nylon material was compared extensively with the standard leather safety strap. It was found that nylon: — Lasts about twice as long as leather; does not require the periodic oiling and cleaning that leather needs; is uniform in quality (as one telephone man commented about leather straps, "Cows just don't grow uniformly"); is less susceptible to damage from mechanical use, such as cutting and knicking; and is less subject to damage by heat.

Another big safety advantage is that the nylon strap is made of multiple-ply construction, with the center ply of a distinguishing red color. In this way, when the lineman sees the red center ply showing through, he can tell that the strap is ready to be replaced by a new one.

The nylon safety strap proved so successful that the material is now being used also in climber straps and in a lighter weight body belt designed for staff people, supervisors, and craftsmen who require a body belt and safety strap for short intervals.

New Herbicide

"BARON," a nonselective herbicide which brings a new chemical principal to vegetation control, is now available for industrial use, The Dow Chemical Company announced last month. The new product is a liquid which emulsifies readily in water.

Active material in "Baron" is 2-(2, 4, 5-trichlorophenoxy) ethyl 2, 2-dichloropropionate, which was discovered as a chemical and developed as an herbicide by Dow research scientists. For convenience this chemical has been given the coined common name *erbon*. It embodies an important fundamentaly new chemical characteristic as the basis for its effectiveness. The material was given extensive field tests last year under the code number M-171. "Baron" contains four pounds of technical erbon per gallon.

"Baron" may be sprayed on leaves, which take it up directly; or it may be sprayed on the soil, from which it is taken up by roots. Its translocation from leaves is relatively independent of rainfall moisture.

When applied to the soil it acts as a residual sterilant, lasting for approximately a season, its effective persistence depending upon various factors.

"Baron" applied to foliage exhibits early contact action which produces a prompt reduction of the vegetation and defines the treated area. This is followed by systematic action which effectively kills most plant species to which it is applied. It has proved to be highly effective against almost all perennial grasses as well as herbaceous plants upon which it has been tested.

"Baron" is easy to use in conventional weed-control spray equipment. It presents no problems of corrosion. Its animal toxicity is very low.

Recommended rates of application range from one to two pints per square rod, corresponding to 100 to 160 lb., erbon equivalent per acre.

C. & P. Tel. Co. Tests New Mobile Equipment

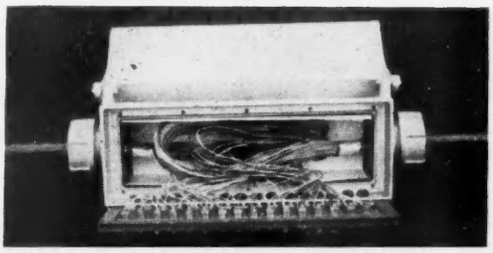
THE LATEST innovation in common carrier mobile radiotelephone service — special direct dispatching service — was recently started in Baltimore, Md., with trial installations by the Chesapeake & Potomac Telephone Co. of Baltimore City for a burglar warning operation, a trucking company, a firm which services coin laundry machines, a Baltimore municipal department, and a dairy, either already installed or in the planning stages.

The service is intended to provide dispatching without attendance of a traffic operator between a customer's dispatcher and his associated fleet of vehicles, and is expected by the company to be attractive to customers having a requirement for frequent, short, two-way communications with their mobile units.

The equipment for the system was developed by the Bell Telephone Laboratories. The Baltimore trial is the first installation, and is operating in

CHANNELL CABLE TERMINAL

For plastic or lead cables



Patents #2318755-2434102-2683304

Channell CABLE Splicing Machine Co.

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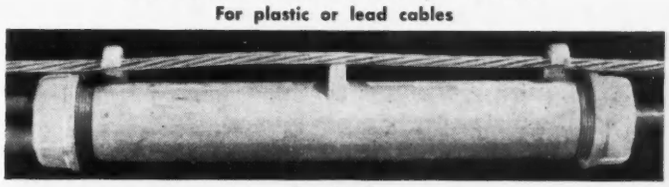
	Channell Terminal yes	no
1. Will it require splicing wires		√
2. Will it be bolted to strand or pole		√
3. Will the gaskets be made in the field		√
4. Is the housing a thin casting or stamping		√
5. Does it have more than 23 parts, including all material		√
6. Will it require more than 26 Minutes to place & install		√
7. Will a 11 pair cost more than $18.45 including material		√
8. Will it require platform or ladder to install		√
9. Will it have 44 finger twist connections at each splice		√

A sleeve that will take up to 1 1/8" diameter cables and can be placed in less than 2 Minutes

ORDER NOW!

CHANNELL CABLE SLEEVE, TYPE S-1

For plastic or lead cables



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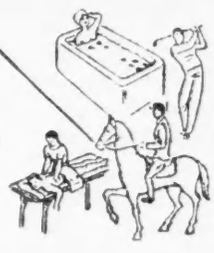

Renew your health at one of the South's finest resort hotels! Guest can go directly from room in robe and slippers to our own Bath House located within hotel. Bath House under regulation of the Department of the Interior.

All sports available — wonderful fishing and golf!

560 Rooms 70% AIR-CONDITIONED — All with bath or toilet.

A directory for the Home Telephone Company of Ridgway, Penn. printed by

R. R. DONNELLEY & SONS COMPANY

350 East Twenty-second Street, Chicago 16

coming CONVENTIONS

Arkansas Telephone Association, Arlington Hotel, Hot Springs, September 26 and 27.

Tennessee Telephone Association, Hermitage Hotel, Nashville, September 29 and 30.

United States Independent Telephone Association, National Convention, Conrad Hilton Hotel, Chicago, October 10, 11 and 12.

North Carolina Independent Telephone Association, Carolina Hotel, Pinehurst, October 17 and 18.

Virginia-West Virginia Independent Telephone Associations, Roanoke Hotel, Roanoke, October 20 and 21.

Oklahoma Telephone Association, Huckins Hotel, Oklahoma City, October 20 and 21.

South Carolina Telephone Association, Clemson House, Clemson, October 24 and 25.

South Dakota Telephone Association, Cataract Hotel, Sioux Falls, November 3 and 4.

Alabama-Mississippi Telephone Associations, Thomas Jefferson Hotel, Birmingham, Ala., November 14 and 15.

Georgia Telephone Association, De Soto Hotel, Savannah, November 17 and 18.

Florida Telephone Association, Hotel Daytona Plaza, Daytona Beach, November 21 and 22.

Kentucky Independent Telephone Association, Phoenix Hotel, Lexington, March 6, 1956.

the 150 megacycle range. A similar trial is being planned at another city using frequencies in the 450 mc range. The initial Baltimore installations are to serve 16 vehicles. Capacity of the equipment in operation is nine customers and 100 vehicles, but additional channels can be added to meet future demands.

From a dispatcher standpoint, the telephone company reports, the operation of the system will be less difficult than that of normal telephone service. During idle channel periods, removing the hand set from the cradle energizes loud speakers contained in all vehicles in the fleet. The dispatcher designates by voice the particular vehicle he wishes to talk with, and when that driver answers, all the loud speakers in the non-answering vehicles are automatically silenced.

If the channel is busy, the equipment will automatically register the dispatcher's call and reserve channel time for him. Upon release of the channel, the equipment automatically selects and rings the dispatcher who first placed the call during the busy interval; then, in turn, any other dispatchers or drivers who may have been waiting.

From the mobile station standpoint, pressure from a driver on the push-to-talk button on his hand set automatically signals his dispatcher during idle channel periods. During busy channel periods, the equipment reserves the channel for his use and automatically signals the dispatcher when the channel becomes available. The mobile radio loud speaker is muted except when its associated dispatcher is voice-calling a particular vehicle or vehicles.

Crimp-Type Connector

A NEW CRIMP-TYPE wire connector with a unique diaperwrap insulator has been introduced by Ideal Industries, Inc., Sycamore, Ill. The new connector is said to have extremely high mechanical strength and insulating qualities.

Known as the Ideal Crimp Connector with "Wrap-Cap" insulator, the new connector has only two parts, the sleeve and the patented insulating cap. Both parts are listed by Underwriters' Laboratories, Inc., for general use for branch circuits and fixture wiring.

The insulator is applied by pushing it down over the crimped sleeve and wires and then drawing the tabbed cap and connecting strip through the wires and over the end of the joint in a diaper-wrap. The resulting insulation is said to have higher dielectric strength than the insulation on the wire itself.

A number of outstanding advantages are claimed: The diaper-wrap insulator provides a factory-perfect, pre-fabricated insulating job. Without the use of tape, it insulates all around the joint — and between the wires and provides double thick, puncture-proof insulation over the sleeve and wire ends. Maximum safety is assured because the deep skirt of the insulating cap completely covers the bare conductors, even when wires are not stripped exactly evenly. The completed joint occupies very small space.

The "Wrap-Cap" insulator is made of the same type of flexible vinyl material used for TW wire and is practically impervious to aging, corrosive atmospheres, sunlight, gasoline, etc. It is listed for maximum temperature of 165° F. and works easily at minus 10°F.

The Ideal Crimp Sleeve is made of cadmium plated steel to insure greater holding power. It is open at both ends to allow visual observation of the joint. While primarily intended for use with the "Wrap-Cap" insulator, it may also be used with tape in making approved wire joints. The sleeve is slipped over the stripped and twisted wires, crimped and the excess wire ends clipped.

8½" Electricians' Pliers with special crimping die — eliminates the need for the special crimping tool. New England nose easily gets into hard-to-reach places, can be used for twisting wires and burring conduit. A single crimping die, for use with Ideal Crimp Connectors, is located at the point of maximum leverage, makes a double indentation — causes copper in wire to cold-flow in all directions for exceptionally strong mechanical joint. Special plastic grips give comfortable, powerful hold. Pliers are unconditionally guaranteed against defects in workmanship and material.

New Method Of Brush Control With "Telvar" W Weed Killer

CHEMICAL control of trees and brush by soil application of one of the new substituted urea herbicides,

Same formula as famous Kroil that has pleased 14,000 industrial users for 10 years or more.

Loosens stuck together metal parts, bushings, bearings, bolts, screws, pipe, etc., "anything from an embalmer's needle to a bulldozer," one customer said.

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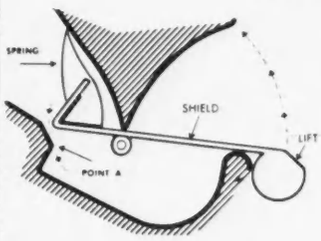

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YOUR TELEPHONE and HOW IT WORKS

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The material includes fundamental information on sound vibrations, how they travel, how they are picked up, how they are transmitted by electrical current. It describes in detail the marvelous dial and the selectors which do the work of operators in large exchanges. These and scores of other facts make this a truly wonderful story for anyone who is curious about how his telephone works.

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"Telvar" W weed killer, is now recommended for utility rights-of-way, railroads, and drainage ditches in six states. For effective kill, the stem of the plant is encircled with a ring of spray, about a foot from the base. It is not necessary to wet the stem of the plant. The sprayed ring should be about four inches wide. Treatment is effective at any time of year. Two to four ounces of the chemical are used in each gallon of spray.

Present recommendations for this method of using "Telvar" W apply only to Oklahoma, Texas, Kansas, Missouri, Arkansas, and Louisiana. Test work is continuing, to see if the same recommendation can be adapted to climatic conditions, plant species, and soil types in other areas. Woody plant species which have been controlled by this method include: elm, red cedar, persimmon, hackberry, willow, sumac, buckbrush, and various species of oak.

Applications made during the growing season usually effect the plant about a month. The above-ground part of severely affected plants in test plots died and became brittle within four to five months after the first appearance of symptoms. Applications made during the dormant season may not show any effects until after the plants leaf out.

"Telvar" W weed killer, based on 3-(p-chlorophenyl)-1, 1-dimethylurea, is one of Du Pont's family of substituted urea herbicides. It has been widely used as an industrial weed killer for several seasons. It has been recommended at dosages of 40 to 80 pounds per acre for industrial use where it is desirable to keep the ground free of vegetation for an entire season or longer. Because of its extreme potency, it should not be used near valuable trees or other plants, or on areas into which the roots of such trees may extend. The material is non-volatile and non-flammable, and low in toxicity to people and animals.

FREE LITERATURE

To obtain copies of literature reviewed in this department fill out the coupon on page 89.

Batteries

Check 204 on Reader's Service Card

C & D BATTERIES, INC., Conshohocken, Pa., has released its newest catalog Bulletin T-527/55. The bulletin covers C & D's complete line of PlastiCell (high-tensile alloy grids) batteries for the telephone industry. Included in the specifications are data on battery ratings and capacities, details of design and construction, dimensions, weights and types of containers.

Conduit

Check 205 on Reader's Service Card

A NEW BOOKLET from National Electric Products Corp. describes a new heavy-duty, rigid steel electrical conduit. In the booklet, the company has reproduced test data sheets compiled by independent Pittsburgh Testing Laboratories which show how the specially protected conduit stands up under the corrosive attacks of salt spray, sulfuric acid, caustic soda, and exposure to excessive heat as compared with another well-known conduit.

Draftsman's Alphabet

Check 206 on Reader's Service Card

JOHNSON RESEARCH CORP., (Dept. TE&M), Bethpage, L.I., N. Y., announces a free distribution of a "Greek Alphabet For Draftsmen," designed as a ready reference guide for Greek symbols that are used in engineering work. Printed on actual "Transeal" stock to simulate a title block, the complete alphabet image measures 4⅛″ x 2⅜″, an ideal size for mounting on the drafting board or Dazor lamp. Transeals have found wide industrial use for Title Blocks, Bill of Materials, Change Blocks, Symbols, and others to eliminate costly hand lettering and ruling, by the draftsman, as well as rubber stamps. The Johnson "Greek Alphabet For Draftsmen" will be sent free on request made on a company letterhead.

"Fade-Out" Tracing Paper

Check 207 on Reader's Service Card

CATALOG FROM Clearprint Paper Co., Dept. P-2 (TE&M), 1482 67th St., Emeryville, Calif., describes Clearprint drawing and tracing paper with "disappearing" grid lines. This time-saving "fade-out" paper is printed with light-blue cross section rulings which completely disappear on direct print reproductions and blue prints. Using the printed grid as a guide, scale drawings are easily and accurately made, and freehand lettering quickly applied without the need for penciled guide lines or mechanical scaling aids. Reproductions of the original drawings are sharp, clean and entirely free from cross section rulings. Pencil and ink lines can be erased repeatedly without "ghosting," assuring clear, easy-to-read prints.

The paper is supplied in 16 lb. and 20 lb. stock with grid lines printed 8x8 or 10x10 to the inch, inch lines heavy. In addition to rolls, fade-out paper is also available in sheets up to 42″ in width, and in 8½″ x 11″ pads.

Filing System

Check 208 on Reader's Service Card

A BROCHURE describing the new, space-saving Visi-Shelf Filing System is now available from Visi-Shelf, Inc. This brochure explains in detail how businesses can recover space given over to the filing of records for other uses, as well as achieve savings in the filing operations.

Power

Check 209 on Reader's Service Card

"POWER FOR PROFIT" is the title of a new booklet concerning Caterpillar Diesel Engines and Electric Sets released by Caterpillar Tractor Co., Peoria, Ill.

"What does power mean to you?"

asks the booklet and then answers this and several other questions concerning the protective value of Cat Diesel Engines. Features of Cat Diesels, such as filters, pistons, rings and connecting rods as well as other parts, also are described. The proof is enumerated with five testimonials.

The booklet concludes with the statement that Cat-built machines are backed by a "no orphans" policy, quick service and adequate parts stock. The booklet (Form D524) is available from your local Caterpillar Dealer or by writing Caterpillar Tractor Co., Peoria, Ill.

Radio

Check 210 on Reader's Service Card

RAYTHEON Product Data Sheet PD 3-255, describes the Raytheon cuelink Model ACL-3, a frequency modulated radio communications system designed to provide a means of maintaining permanent or mobile two-way communications between transmitter and receiver microwave sites. The literature carries data on design features and operation of the equipment as well as a description and specifications of this highly portable communications system.

Record Storage

Check 211 on Reader's Service Card

DIEBOLD, INC. has published a new, 2-color, 4-page, illustrated Catalog No. AL-2804 which provides complete information on a new low-cost, space saving method of storing inactive records in "Safe-T-Stak" steel storage files.

This informative brochure tells . . . how to reduce waste space normally required for storing inactive records . . . how to eliminate cost of shelving . . . and how to promote orderliness and efficiency when storing records. These and many other pertinent facts relative to record storage are comprehensively discussed and, practical solutions are offered.

To facilitate selection of the correct file unit to meet individual requirements, a comprehensive chart is provided. It lists model numbers, inside dimensions for width, height and length of drawer as well as outside file specifications for each size "Safe-T-Stak" unit available today.

Wire, Cord and Cable

Check 212 on Reader's Service Card

A NEW 20 PAGE illustrated catalog covering telephone wire, cord and cable is now available from Whitney Blake Co., New Haven 14, Conn. The new bulletin, T-3, has sections on the company's TELECABLE polyethylene exchange area cable, inside wiring cable, and rural distribution wires as well as TELEPRENE drop wires, inside and distributing frame wires. Complete information on standard TELECORD replacement cords and KOILED KORDS retractile cords is also included.

"Telelink"

Check 213 on Reader's Service Card

RAYTHEON Bulletin 3-206 describes the Model TCR-12 "Telelink," an automatic two-way telephone, telegraph, teletype and telemetering microwave communications system operating in the common carrier or industrial bands. Designed to meet FCC standards, the TCR-12 is adaptable to meet either permanent or changing installation requirements.

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B. L. Fisher Dies

B. L. FISHER, 76, president of the Lee Telephone Co., Martinsville, Va., and one of the nation's pioneers in the telephone industry, died August 22 following a long illness.

A native of Franklin County, Va., Mr. Fisher became a teacher in county schools in 1897 at the age of 19. Two years later he opened a country store, while continuing to teach in the Winter.

His interest in telephones became aroused when one of the first telephones was installed in his store. In order to better understand the new invention, he dismantled it and then restored it to working order. This led to his becoming one of the area's first telephone repairmen.

In 1903, Mr. Fisher gave up the store and his other interests and took charge of the telephone plant of the Rocky Mount Telephone Co. In 1913, he organized the Light & Power Co. of Rocky Mount and his own electrical contracting firm.

The Lee Telephone Co. resulted from a merger in the late twenties of the Fisher Telephone Co. of Martinsville and companies in Franklin and Stuart counties.

The late B. L. FISHER, pres., Lee Tel. Co., Martinsville, Va.

The company is now one of the largest Independent telephone companies in the nation. It extends service to Franklin, Henry, Patrick and Pittsylvania Counties in Virginia and three counties in North Carolina. There are 14 exchanges in the system.

Mr. Fisher was past president of the Martinsville Kiwanis Club and the United States Independent Telephone Association. He was a member of both the North Carolina and Virginia Independent Telephone Associations, and a member of the board of trustees of Ferrum Junior College in Franklin County and Asbury Theological Seminary, Wilmore, Ky. He was well known for his lay work in the Methodist Church.

His wife, the former Cora Lee Prillaman, of Franklin County, died several months ago. They had no children.

J. W. Hannon Dies

J. WALTER HANNON, 64 years old, pioneer in the telephone industry and former general plant manager of the Indiana Bell Telephone Co., died July 22, in St. Vincent's Hospital, Indianapolis, Ind.

A native of Leavenworth, Kas., Mr. Hannon launched his career in the industry in Kansas when he was 15.

After serving in a Kansas telephone company several years he joined the Central Union Telephone Co., in Chicago in 1919, beginning as an engineer.

At the age of 29 he was named

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district plant supervisor for Indiana Bell, the year the company was organized.

Five years later he became general plant manager, a post he held until his transfer to New York in 1944.

There he was appointed plant construction engineer for the American Telephone & Telegraph Co.

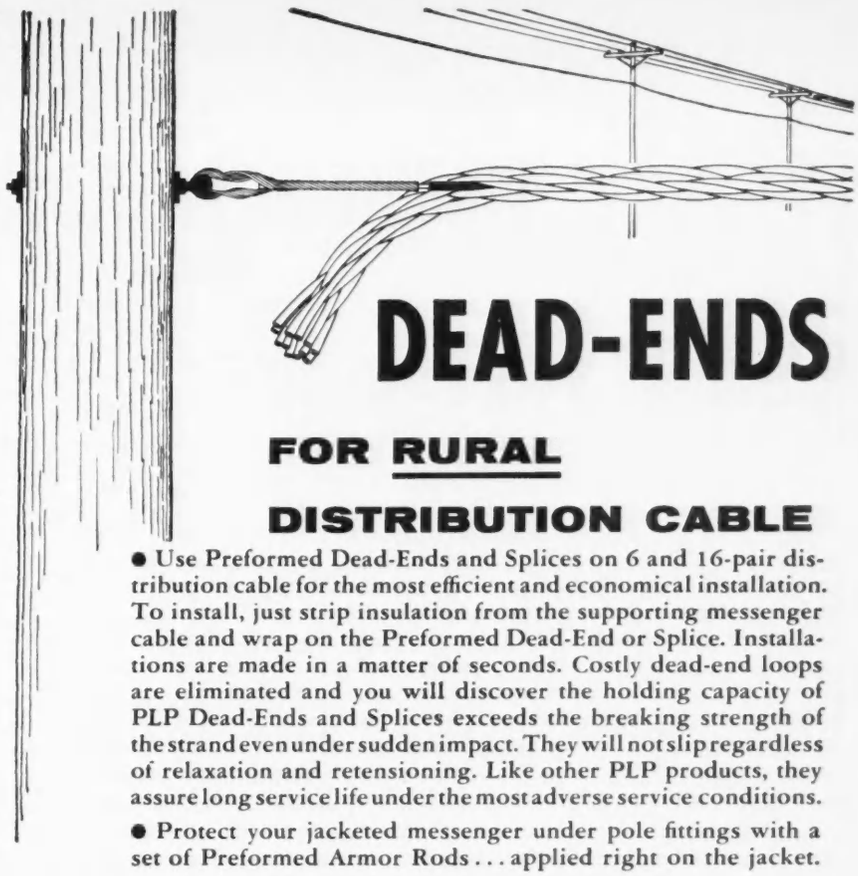
Mr. Hannon retired last April 1, after 50 years and three months in the industry, and returned to Indianapolis.

Survivors are the widow, Mrs. Helen M. Hannon a daughter, Miss Evelyn L. Hannon; and a son, John W. Hannon, all of Indianapolis; a brother William A. Hannon Sr. of Kansas City, Mo., and a sister Mrs. F. E. Davidson of Indianapolis.

Lincoln Tel. & Tel. Plans Sale of Common Stock

HOLDERS OF common stock of the Lincoln (Neb.) Telephone & Telegraph Co. were notified on August 22 that the executive committee of the board of directors on August 12 had authorized the sale of 7,128 shares of common stock of the company, $16-2/3 par value, at a price of $37 per share.

R. E. POTTER, engineering supervisor for General Telephone Co. of Calif., became chief engineer with General Telephone Co. of the Southeast at Bluefield, W. Va., on Sept. 1. A veteran in the field of telephony with 16 years experience, Mr. Potter joined General Telephone Co. of Calif. in 1948. Prior to that he served with the London Telecommunications Region, which is owned and operated by the General Post Office in London, England. He received his schooling in London and was graduated from engineering college prior to his entrance in the Royal Air Force in 1940.



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● Protect your jacketed messenger under pole fittings with a set of Preformed Armor Rods . . . applied right on the jacket.

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● Protect and hold new self-supporting cable with a firm elongated grip that distributes a low unit pressure over a large area . . . that eliminates damage to the conductor without permitting slippage.

PREFORMED GUY-GRIPS

● Assure the fastest, most economical and efficient means for dead-ending guy strand and messenger . . . do not slip under any condition—impact or intermittent loading. They are wrapped on the strand by hand without the aid of wrenches or compression tools. Easily removed for retensioning.

PREFORMED SPLICES

● Are used for new construction and for repairing damaged or broken strand . . . restores full strength to the strand.

PREFORMED LINE GUARDS

● Fit snugly without the use of clamps or clips. They guard against concentrated stresses and are ideal for protecting conductors from the abrasion by trees, buildings or other objects. A must for protection at tangent supports.

PREFORMED SPLINTS-AND-TIES

● Reinforce the conductor and provide protection during the life of the line . . . eliminate wear and chafing, resist slippage and greatly reduce maintenance.

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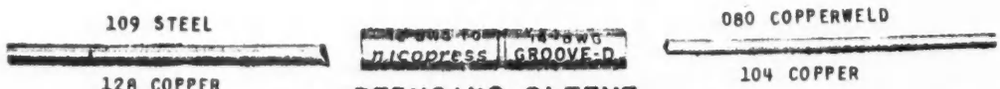
TELEPHONE ENGINEER & MANAGEMENT'S

HANDBOOK DATA SHEETS

Prepared By

JOHN S. REED

Compression Type Sleeves (Continued)



REDUCING SLEEVE

2-109X083D FOR 109 STEEL TO 080 COPPERWELD LINE WIRE
3-128X102D FOR 128 COPPER TO 104 COPPER LINE WIRE

(SPLICING METHOD IS SAME AS FOR STRAIGHT OR SPLICING SLEEVES.)

REPAIR SLEEVE

(FOR REPLACING DEFECTIVE TWIST SPLICES)

080 COPPER LINE WIRE - R1-080D SLEEVE
102 COPPER LINE WIRE - R1-102D SLEEVE
109 STEEL LINE WIRE - R2-109D SLEEVE

FIGURE ONE-B

Since different wire sizes require sleeves with corresponding bore diameters, these sleeves will vary in outside diameter, requiring pressing tools with different groove die sizes as indicated in the list of typical sizes of straight sleeves below:

Wire Material and Size	Sleeve Size No. (Nicopress)	Pressing Tool Groove Size Nicopress
No. 18 or No. 17 Bronze or Copperweld	3-045 B	B*
No. 16 Copper	3-051 B	B*
No. 14 Copper	3-064 B	B*
080 Copper	1-080 C	C**
080 Copper or Copperweld	1-080 D	D**
102 or 104 Copper	1-102 C	C**
102 or 104 Copper	1-102 D	D**
102 or 104 Copper	1-102 E	E**
102 or 104 Copperweld	1-102 J	J**
128 Copperweld	1-128 J	J**
109 BB Steel	2-109 D	D**
109 HTL 85 Steel	5-109 D 85	D**
109 HTL 135 Steel	5-109 D 135	D**
109 HTL 190 Steel	5-109 D 190***	D**

* In Nicopress 17-2 tool.
** In Nicopress 31 tool.
*** Special alloy steel for rural distribution cable support wire or 109 HTL 190 high strength steel line wire.

Pressing tools are available in various single- or double-groove sizes as shown in Figure 2. The double groove tools are employed for splicing more than one size of line wire, as for example: 31-DC, 31-DJ, or 31-CJ tool.

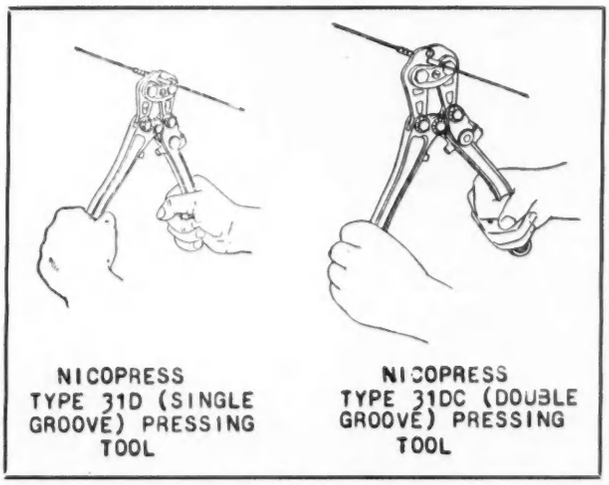


FIGURE TWO: — Two types of pressing tools for Nicopress compression sleeves used on line wire.

TELEPHONE ENGINEER & MANAGEMENT'S

HANDBOOK DATA SHEETS

Prepared By

JOHN S. REED

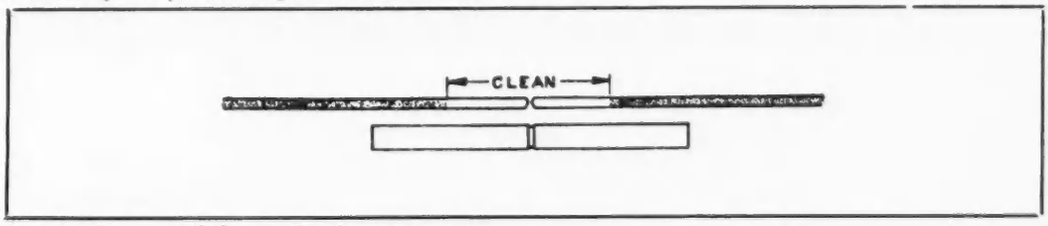
Compression Type Sleeves (Continued)

To simplify stocking of different sizes of compression sleeves, and enable the use of one single-groove pressing tool for various wire-sizes, it is possible to obtain sleeves with the same outside diameter for a specific groove size but with different bores to fit corresponding sizes of wires. For example, in the case of line wire sizes from 080 up to 128 mils, Nicopress 31-D tool can be used to crimp D sizes of sleeves such as 1-080D for 080 copperweld; 2-083D for 083 steel; 2-109D, 5-109D 135, or 5-109D 190 for 109 steel; 1-102D for 104 copper; and 3-128D for 128 copper wires. The 080 and 083D sleeves are made larger than normal for C type sleeves and the 128D sleeves are made smaller than the J type to fit the D groove. To maintain the standard strength of 128 sleeves, bronze is employed for the material instead of copper.

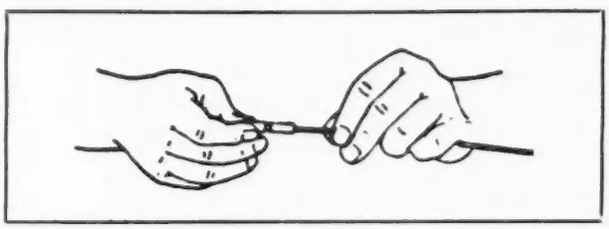
When different sizes of line wires are to be spliced together, reducing type compression sleeves are employed to join the wires. These reducing sleeves are quite convenient when it is necessary to tap one size of a spur wire to a main line wire of a different size, as, for example, an 080 Copperweld wire line to an existing 109 steel wire line. By using a reducing sleeve in the jumper connection between the spur and main wires, the need for a special tap sleeve to fit both wire sizes is eliminated, thus keeping down stock requirements for special sleeves which are needed only occasionally.

Splicing Procedure Using Nicopress Straight Sleeves

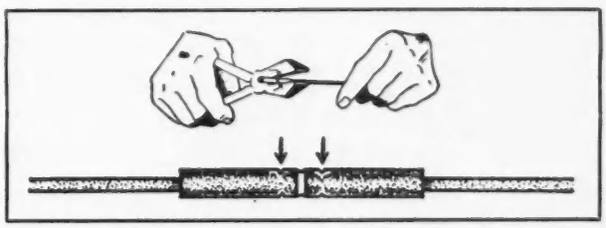
When splicing line wire that is tarnished or corroded, the wire ends should be first thoroughly cleaned and brightened with a coarse-grit wire polisher (abrasive paper) for galvanized steel wire or fine-grit polisher for copper wire. Use light strokes when cleaning black or gray galvanized wire so as not to remove more galvanizing than necessary. Wipe the brightened surface with back of polisher to remove loose particles. CAUTION: To avoid corrosion from excessive removal of galvanizing on steel wire, clean only one-half of the wire ends that will be inside the sleeve as indicated below. Do not attempt to clean new or bright galvanized steel wire with the wire polisher.

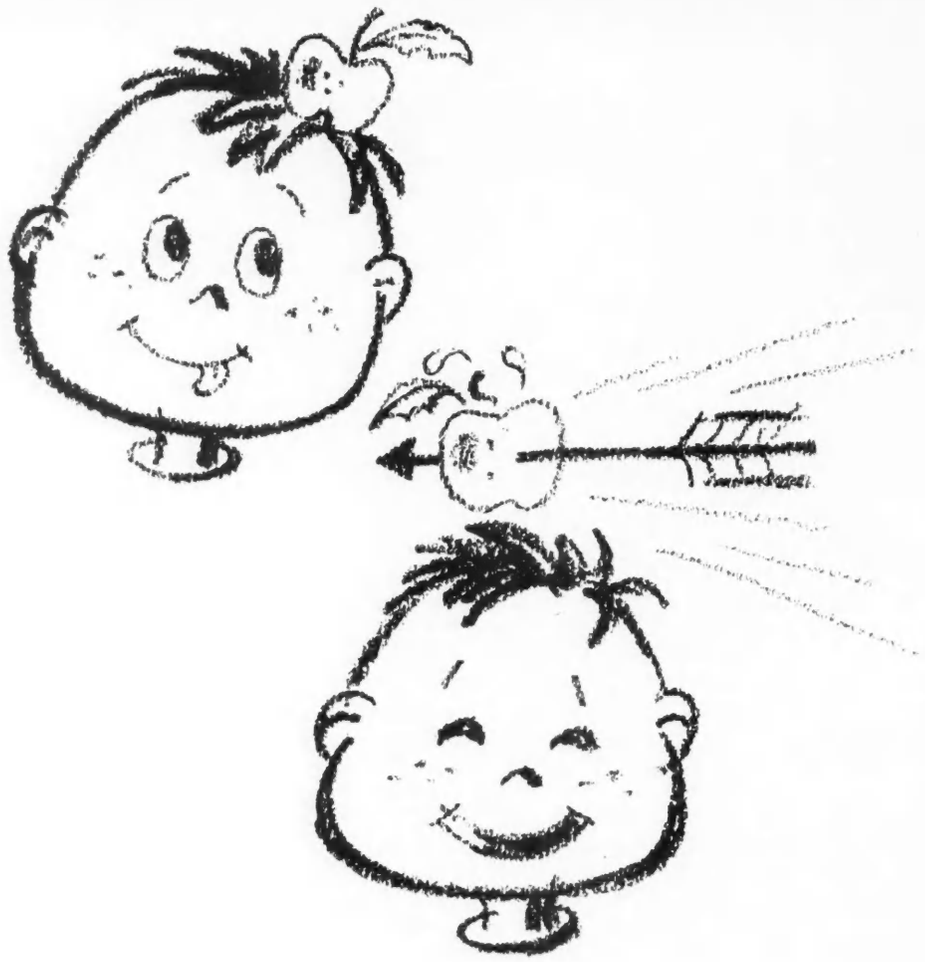


Push wires into sleeve until they strike the center stop. If wire will not go all the way in to the center stop, do not twist it. Remove the wire, straighten it, and clear the burrs from the cut end. Then push STRAIGHT in.



Pinch sleeve with cutting pliers at each side of center only enough to hold the wires from sliding out of position before splice is finished.





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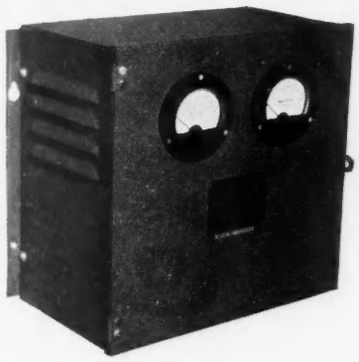

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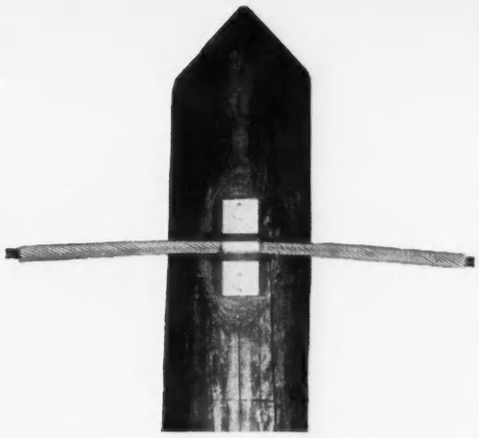
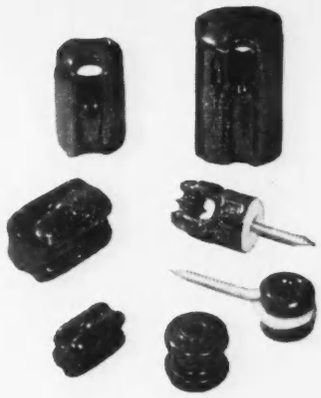


PLP Tangent Support (shown here) for self-supporting telephone cable protect while firmly holding cable in an elongated grip in which the unit pressure is small because of large area of gripping surface. PREFORMED LINE PRODUCTS CO.



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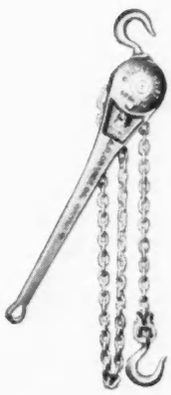
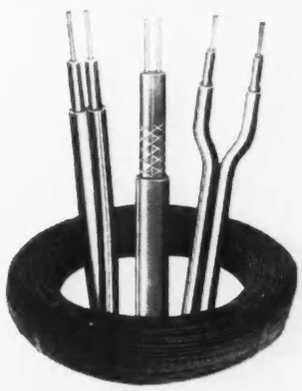
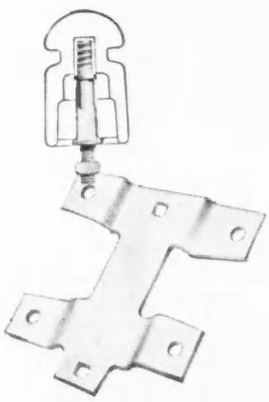


Designed for Linemen! — Simple controls of the Chance One Ton Hoist can be operated without removing heavy work gloves...is light in weight and well balanced. Flexible heavy steel load chain will not kink, bind or uncouple. A. B. CHANCE CO.



Long Service Life and Low Plant Costs go hand-in-hand with the installation of ENDURPRENE — The Neoprene Drop Wire available in Copperweld and Bronze. This flexible and easy to handle wire is made by GENERAL INSULATED WIRE WORKS, INC.



Standard in the Telephone Field for transposing wires at the Cross Arm. The No. J8286 "Point" Transposition Bracket is made of high carbon steel —will stand any stress. 6-C Insulator Pin, also standard, now available for prompt delivery. JOSLYN.

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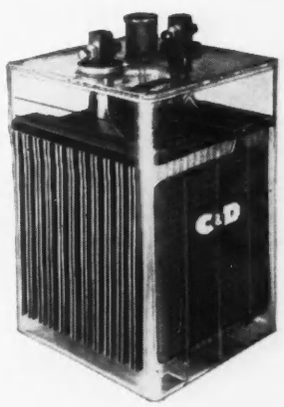


Extra-Long Life! — The suspended and supported plate construction is an exclusive feature of C&D BATTERIES. Choose C&D's PlastiCal (lead-calcium grids) for life expectancy of 25 years. for 14 years expectancy, specify PlastiCell (high tensile lead alloy grids).

C & D BATTERIES, INC., Conshohocken, Pa., manufacturers of industrial storage batteries began operations at its new Attica, Ind. plant (above) in June, according to C & D executive vice president, J. F. Rittenhouse. A complete line of storage batteries for use in the telephone, industrial truck, railroad, mining, marine and control fields and special-purpose batteries will be manufactured in the new plant.

Carolina T&T Installs Microwave Facilities

A TWIST OF A DIAL will bring a new television station with its NBC network hookup to Eastern North Carolina's television audience in September contingent only on the construction of the television station's transmitting tower and building at Grifton and the installation of the necessary equipment.

This was announced last month by an official of Carolina Telephone & Telegraph Co., Tarboro, N. C., who added that the telephone company was proceeding according to schedule with its plans to provide network facilities for the new television station.

The video, or picture portion, of network programs will be transmitted from the telephone company's 318 foot micro-wave tower at Castoria, near Snow Hill, for a distance of some 20 miles to the transmitting tower of WITN located at Grifton. The Castoria tower was constructed in 1953 for the provision of network facilities for WNCT at Greenville.

Micro-wave signals from the Castoria tower will strike a reflector mounted some 180 feet up on the WITN transmitting tower and be directed to an eight-foot saucer-shaped disc at the bottom of the tower. Micro-wave signals from this disc will in turn be funneled into the transmitting station to be radiated out through the transmitting tower to the television sets of Eastern North Carolina.

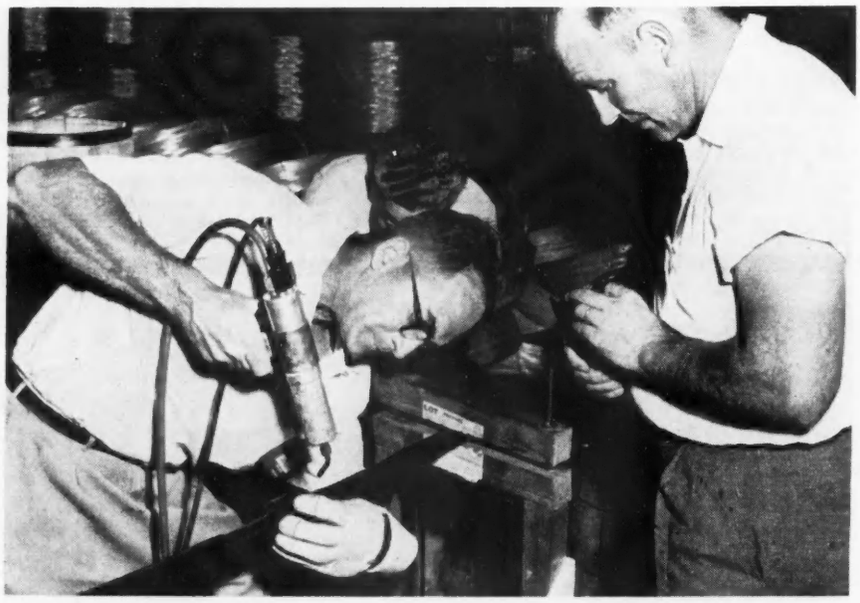
The Castoria tower will receive the micro-wave signals from a series of similar towers beginning at Westover, near Raleigh where contact will be made with national network facilities. These micro-wave towers, located at 20 to 25 mile intervals, act as booster stations and relay the television signals from one tower to the next until they arrive at their destination.

The towers which will transmit the video (picture) to WITN are located near Westover, Smithfield, Goldsboro and at Castoria, N. C.

And while the network pictures will be transmitted by micro-wave, the audio, or sound, will be transmitted over land lines provided by the telephone companies.

Carolina Telephone & Telegraph Co. will deliver network audio to ties from Goldsboro to Grifton while American Telephone and Telegraph Co. will deliver network audio to Goldsboro.

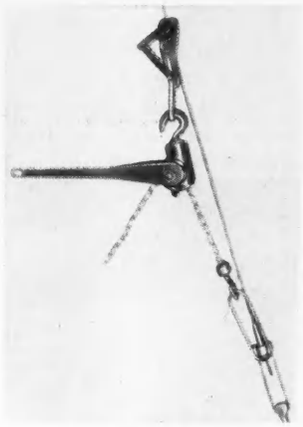
Existing cable from the exchange at Grifton will be extended by the Carolina Company to carry the last lap of the audio link to the transmitter site located some two miles out of Grifton on the Vanceboro Highway.



To acquaint telephone company personnel with new and better methods of plant construction and maintenance, North Electric Co., Galion, Ohio was host to 24 representatives from telephone companies in Ohio, Michigan, Illinois, Indiana and Minnesota. The occasion was a one-day cable-splicing and cable loading school under the direction of D. F. Snyder, North sales manager, and R. O. Doyle, manager of telephone supplies. K. C. Gillette and K. Blythe, cable specialists from Ansonia Wire & Cable Co., and R. A. Clark, Jr., president of the Communication Equipment Co., Chicago, instructed the group in latest methods of cable splicing and cable loading. Shown in photograph are J. R. FOX (left), Waldron (Mich.) Telephone Co., and CARL L. AGNERS, Arthur Mutual Telephone Co., Defiance, Ohio, splicing plastic cable using the gas welding method.

Automatic's pointers for pole line construction

SHORT CUTS TO FASTER GUYING

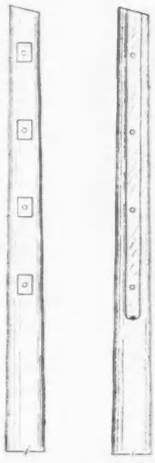


Reliable Strandvise and Coffing Hoist

Here is a combination to hold down your company's guying costs. All that is needed to dead-end the guy wire is to slip the strand through the nose of the Strandvise. No clamping hardware required.

Then with a Coffing Hoist (which is tested at 100% over its rated capacity), the strand is fed through the steel jaws of the Strandvise until the proper strain is reached. The greater the load, the tighter the hold. Telephone construction men are finding there is nothing faster or more efficient for guying purposes.

Cat. No.	Description	Each
S-7203	Strandvise 5/16″	$ 1.34
S-7205	Strandvise 3/8″	1.65
S-4792	Coffing Hoist 3/4 ton cap.	47.70
S-7215	Pulling Hook	.90



Gained and Bored Telephone Poles

To save construction time and labor, creosoted poles furnished by Automatic Electric are gained and bored according to your company's specifications. And to assure maximum protection, the framing is done before the creosoting process.

Here's a money-saving tip: Since freight charges are a big part of the cost of poles, many companies include an order of creosoted cross arms to make up a carload shipment. The savings in freight charges are substantial. For prompt shipment send your order to your nearest Automatic Electric warehouse.

Angle Bolt Eye

With an Angle Bolt Eye attached to a cross arm bolt, three to five feet of guy strand can be saved. No wrapping wire around the pole; no need for strain plates, guy hooks, lags and nails. This all means savings in time, materials and labor. Angle Bolt Eyes are drop-forged and galvanized; will take ½ inch strand or under.

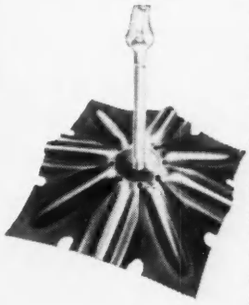
Cat. No.	For Size Bolt	Each
S-2164	5/8″	$0.57

Eye Anchor Rod

Eye opening at one end eliminates need for guy thimbles. Rod end is made to conform to the curvature of guy strand so wire can be pulled tight without distortion. Drop-forged, heavily galvanized, with clean threads.

Cat. No.	Size	Each
S-6164	5/8″x6′	$1.62

Chance 8-way Anchor



In a storm, good anchoring can often mean the difference between a pole line torn down or still standing up. Some helpful hints passed on by construction men are: Make sure the anchor hole is in direct line with the guy wire pull, that the expanding anchor is fully expanded, and that earth over it is firmly tamped down.

The Chance 8-way Anchor is preferred by many telephone companies for safer guy anchoring because it pushes eight blades into undisturbed earth all around the hole, with no wasted space between blades. This means complete balanced load distribution. Catalog No. S-2038 expands to 100 square inches.

Cat. No.	For Size Rod	Each
S-2038	5/8″ or 3/4″	$2.18

Buy Automatic's *Approved* Supplies

Recommended and Sold through our distributors

AUTOMATIC ELECTRIC

ORIGINATORS OF THE AUTOMATIC DIAL TELEPHONE

Distributors in U. S. and Possessions: AUTOMATIC ELECTRIC SALES CORPORATION, 1033 West Van Buren Street, Chicago 7, U.S.A.

- Reaches hard to get at spots
- Bores holes up to 10 feet deep from any truck position
- Low cost—easy to use—easy to transport
- Industry tested and accepted

DIG HOLES—SET POLES WITH YOUR LINE TRUCK AND
TEL-E-LECT'S POLE HOLE DIGGER

When your derrick truck is equipped with a Tel-E-Lect Digger, your crew can dig a hole and set a pole in less than five minutes! This rugged auger, suspended from a front or rear mounted derrick, is raised or lowered by the winch line. Auger rotation power is supplied through a telescoping drive shaft connected to the PTO.

This efficient digger reaches up on a hill, down into ditches, or across obstacles . . . anywhere up to 20 feet behind the truck. The interchangeable hardened steel augers, 8″ to 20″ in diameter, are built to operate under the most rugged soil conditions.

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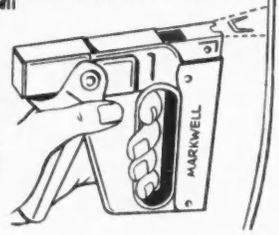
SAVE OVER 50% LABOR & MATERIAL
MARKWELL FREE SERVICE
Factory Service and Over-haul at No Charge and Returned Prepaid When Staples Purchased From Markwell



ONLY $10.75

"HOLDS WIRE SAFE AND SECURE"

For "JK" Wire .....Use L3B 5/16″ Staples
Up to 11 Strand Cable Use L3M 7/16″ Staples
Up to 16 Strand Cable Use L3D 9/16″ Staples

OTHER USES — Stapling Drop Wire, Metal Numerals, Signs, Screens, Building Repairs and Maintenance, Etc.

SIZE	8 per pkg.	15 per pkg.	30 per pkg.
L3B 5/16″ Leg	$2.75	$2.50	$2.25
L3M 7/16″ Leg	2.90	2.75	2.50
L3D 9/16″ Leg	3.10	2.95	2.70

STAPLES PER PKG. — 5000 . . . Sizes Can Be Assorted For Quantity Price . . . Discounts In Larger Quantities.

MARKWELL MFG. CO., INC.
Established 1919
Industrial Products Div.—Dept. 77
200 Hudson St. New York 13, N.Y.

NATCO
CLAY CONDUIT

The proved and standard protection for Underground Telephone Cables. Highest quality and full line of shapes.

NATCO CORPORATION
formerly National Fireproofing Corp.
327 Fifth Avenue, Pittsburgh 22, Pa.

Dial Cutover Completed At Mercer, Missouri

CROWDED INTO ALL available shade around the band stand at Mercer, Mo., and watching from the shade of buildings across the street, a large crowd from North Missouri and Southern Iowa witnessed the ceremonies marking the first conversion to dial telephones of the 23 exchanges of the Grand River Mutual Telephone Corp. at Mercer, last month.

Starting with a concert by the Mercer High School band, the program included an invocation by the Rev. David Houghton and an address

DR. GEORGE F. DAVISON, pres. of the Mercer Boosters' Club, makes first call over new dial system.

of welcome by Mayor Earldean Henry. State Senator James P. Kelly, Trenton, was master of ceremonies and introduced Congressman Clarence Cannon, the principal speaker.

Sitting in the white frame bandstand with the speakers were Mrs. Minnie Miller, telephone operator at Mercer for 33 years until she retired two years ago, and her successor, Mrs. Edna Laws, members of the board of directors of the telephone company, REA and telephone officials, including C. W. Chastain, manager of the Grand River Mutual Telephone Corp.

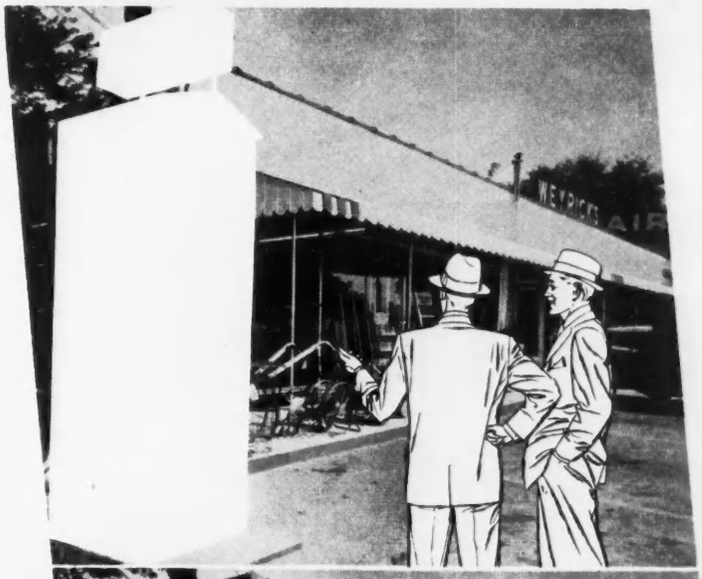
Mrs. Miller and Mrs. Laws were presented with red roses by the business men of Mercer. Mr. Chastain spoke of the development of the telephone company and, pointing to the 24 company trucks parked along the square, said that the company was ready to give the best of service.

Congressman Cannon spoke of the event as a milestone not only in industry but in the state and the nation. Tracing the history of the REA he pointed out that it had made farm homes as attractive as anything a city has to offer and that the first REA telephone in the state of Missouri meant bringing the best telephone service to farm homes.

Members of the Board of Directors

Idea...

An Indiana Independent, alert to new business opportunities, spotted this service station and thought it would make a likely paystation site. He was *right!* This location . . .

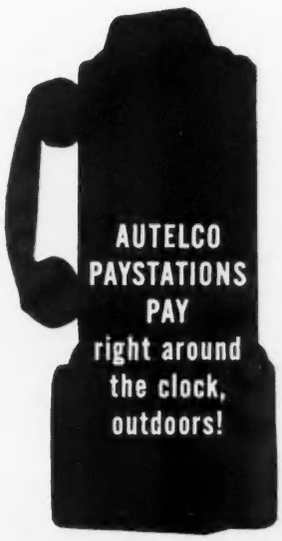


Pays Off

an average of $82.50 per month, and is proving a great convenience to service station customers. Remember . . .

For You...

too, locations like this could be paying rich rewards. Now, while the weather is good, go out and check the service stations in your area—and the drive-ins, highway junctions, bus stations, motels, and trailer camps, too. Install Autelco Paystations in substantial booths; mark them with big, colorful signs—and you'll surely build paystation revenue. Write for Catalog 4078-B and booklet, "How to Make Paystations Pay." *Address: Automatic Electric Sales Corporation, 1033 W. Van Buren St., Chicago 7. Or call HAymarket 1-4300.*



AUTOMATIC ELECTRIC

ORIGINATORS OF THE AUTOMATIC DIAL TELEPHONE

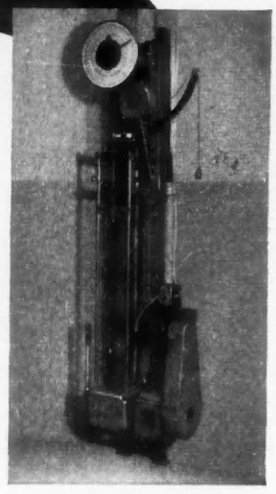
ADHESION TESTS SHOW THE CONDUCTOR BREAKS BEFORE LOWELL INSULATION SLIPS

No. 2 in a series of test results on LOWELL TELEPHONE DROP WIRE. "P Clamp" adhesion test.

The greatest strain on drop wire takes place at the "P Clamp" where the wire is attached to pole or house. The weight of ice and the whipping action of the wind develop extra strain at this point so that the best possible bond is essential, between the insulation and the conductor wire, to insure dependable service and long life.

To develop the strongest possible adhesion, all Lowell wires are brass flashed and special formulas have been evolved for insulation compounds. Lowell jacket compounds also have excellent resistance to abrasion and the ability to withstand the action of the elements under varying atmospheric conditions.

As a constant check, tensile tests are made at the Lowell Laboratories where the conductors are stretched to their breaking point before any slippage of the insulation or jackets takes place. These rigid laboratory tests are your assurance that Lowell Drop Wires will stand up under the most severe conditions and give dependable service without breakdown at this most critical point where the grip of the "P Clamp" must support the entire weight of the span. Year marker threads and manufacturer's identification permit user to keep accurate records of performance and long life in service.



Lowell Drop Wires are continually tested for adhesion of the insulation to the conductor. The conductor must break before the adhesion bond between the insulation and conductor is severed.

Write for Lowell Insulated Wire Catalog

"fine wires only"

LOWELL INSULATED WIRE DIVISION
OF The Overlakes Corporation
171 LINCOLN STREET ··· LOWELL, MASSACHUSETTS

were introduced. They are: J. R. Lowry, Ray Barnett, Princeton; Maurice Hein, Spickard; Harley Leazenby, Harry John, Mt. Moriah; Clarence Ratliff, Ralph Parker, Trenton; Rollin Ryan, Powersville; A. L. Keen, Lamoni, Ia.; Arnold Lovett, Garden Grove, Ia.; and Clayton Shelton, Lineville, Ia.

Dr. George F. Davison, president of the Mercer Boosters Club, put in the first telephone call to Jefferson City. It had been arranged that the first call would be to Tyre W. Burton, chairman of the Missouri Public Service Commission, Jefferson City.

The Grand River Mutual Telephone Corp. was incorporated in December, 1951, with headquarters established in Princeton. Four loans totaling $5,106,000 have been approved by the REA. The company has purchased 34 exchange service areas from nine different telephone companies.

Plans call for approximately 2700 miles of pole line and cable. It involves the rebuilding of the entire system in a 10 county area, including all the poles and lines, most of the central offices and replacing every telephone.

General of Southwest Reports New Rate Boosts

GENERAL TELEPHONE CO. of the Southwest was granted the following rate increases during the month of July, 1955:

Exchange	Effecive	Old Rate	New Rate
Olton, Texas	August 6, 1955		
Dial	Bus.—1-Party	$7.75	$9.00
651 Stations	2-Party	6.00	7.50
	Res.—1-Party	4.50	5.50
	2-Party	3.75	4.75
	4-Party		4.00
Jermyn, Texas	August 1, 1955		
Magneto	Bus.—1-Party	$5.50	$6.25
42 Stations	2-Party	4.25	5.00
	Res.—1-Party	3.50	3.75
	2-Party	3.00	3.25

French Approve $335,965,000 Telephone Program

A CONTINUATION of the $355,965,000 program for the modernization and expansion of the telephone and telegraph systems operated by the French Postal, Telephone & Telegraph Administration has been approved by the French National Assembly.

The PTT Ministry has been granted a total of $285,000,000 with slightly less than half of this amount already earmarked for programs scheduled in 1954 and 1955. The re-

mainder of the funds will be applied to the PTT projects scheduled for the next two years.

The balance of approximately $70,000,000 is for projects to be specially financed, such as the modernization of rural installations to be financed by community groups, or of related projects of a general nature not administered by the PTT.

A report on the French government's Second Modernization and Equipment Plan points out that the telephone remains as one of the few sectors of national activity where wartime shortages still exist. In order to overcome this deficiency, the expansion program calls for a yearly increase in the number of telephones served of about 4 percent. The program includes the development of rural equipment, modernization of telegraph installations with automatic switchboards and teleprinters, and construction of buildings to house telecommunications installations.

Greek Government Reports on Telephone Expansion

THE GREEK government has announced that the first phase of its program for the expansion of telephone facilities by the adding of 24,000 new telephones is now scheduled for completion by July, 1956.

Beyond that date, the program calls for the procurement of an additional 60,000 to 100,000 telephones. The government has negotiated an agreement with the German manufacturing firm, Siemens, to supply telephone equipment valued at about $10,000,000 during the next five years.

Bishop Catalog Describes Company's Tape Products

THE BISHOP MANUFACTURING CORP., 14 Canfield Road, Cedar Grove, N. J., has announced the publication of a new 8-page catalog describing major tape products.

The two-color catalog provides detailed performance and application information about Bishop's Bi-Seal self-bonding insulating tape, No. 125 Electrical Filler Tape, Bi-Prene types "C" and "H" Electrical Jacketing Tape, general purpose Vinyl Electrical Tape and No. 30 High Voltage Splicing Tape. In addition, several typical applications of these tapes are shown.

The new Bishop tape catalog is available through representatives or by direct request to the company.

"Powerful?" "Rugged?" "What about portability?"

Engineers and management have asked these questions of us many times. Our answer is this: Yes, the LAMBDA LINK has all of these features and more. As evidence, we note that the LAMBDA LINK was used to carry the historic atom bomb telecast from Yucca Flats, Nevada, to Los Angeles, a distance of 320 miles; the longest hop being over 80 miles. Even with the extreme climatic conditions encountered the LAMBDA LINK functioned perfectly.

THESE FEATURES DESERVE YOUR "CLOSER LOOK!"

COLOR — Meets all FCC & NTSC color standards.
PORTABILITY — Complete system packaged in compact "suitcase" style housing.
FREQUENCY — STL and Common Carrier (5.1-7.4 KMc).
POWER & RANGE — 1 watt min.; effectively used on 80 mile hop.
LONG HAUL — Multi-link circuits up to 8 links in tandem.
OTHER EQUIPMENT — Lambda manufactures a complete line of auxiliary and test equipment such as camera cables, parabolas, attenuators, etc.

If you have difficult microwave link applications, contact Lambda-Pacific to discuss your requirements.

Lambda LPE Pacific

LAMBDA-PACIFIC ENGINEERING INC.

State 6-1801
Stanley 7-0779

P.O. Box 170
Van Nuys, California

construction and maintenance DIGEST

- 25 years young
- Splice in a trice
- Love this petticoat
- Paper for insulation
- Protect sub-stations

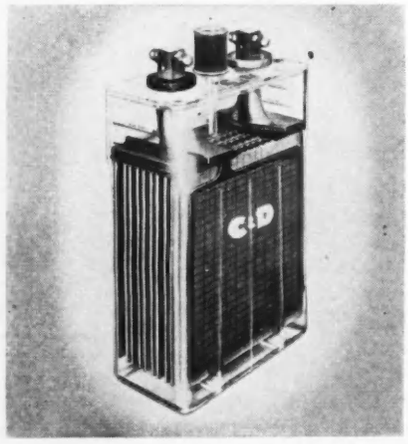
Published every month to help you get the most out of your materials and supplies dollar

by C. J. Reynolds, Stromberg-Carlson Company

The few dollars you spend on *reliable* equipment today will be repaid a hundredfold in lower maintenance costs for years to come. Protect your investment with the double guarantee offered by Stromberg-Carlson. First, leading manufacturers build this equipment, and guarantee it. Second, because we recommend and sell this equipment to the telephone industry, we *also* guarantee its performance!

These two battery types give you decades of good service

Here's a dependable power supply for you with a life expectancy of **25 years!** It's the C & D PlastiCal telephone battery, and when we say it will last 25 years, we're thinking about **full float service.**



This low-cost PlastiCell battery has life expectancy of 14 years. Its PlastiCal counterpart will last you 25 years.

You get this extra-long life because C & D PlastiCal (lead-calcium grids) batteries have an exclusive suspended and supported plate construction.

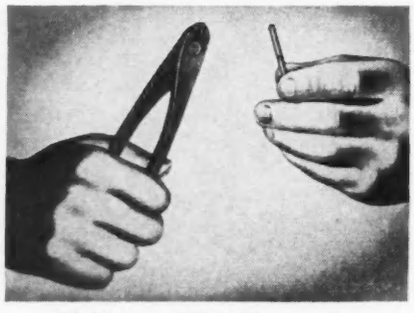
If a 14-year life expectancy will fill your needs, C & D has an economical battery for that, too. It's the PlastiCell battery, using high-tensile lead alloy grids.

In the picture, you see one of these PlastiCell batteries. It's the CE-11 and has a 660 A.H. capacity. In PlastiCal, specify PCE-660.

Splice it fast . . . and it *stays* fast

Here's how to make a quick splice that holds fast, even under the most intense vibration. In fact, your splice will outlast the conductor!

You need two items; a Nicopress sleeve, and the Nicopress tool that is designed especially for use with these sleeves. You simply butt the bared wire ends together inside the sleeve, and you've got a joint that won't ever pull out! Quick and easy.

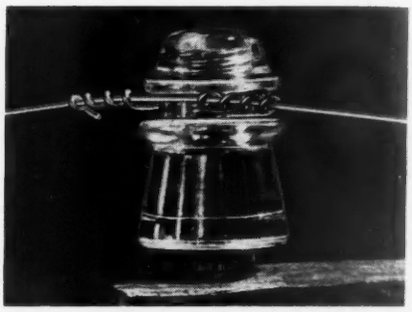


This Nicopress 17-2 tool plus this Nicopress sleeve make better pair splices, faster.

The alloy lining inside the sleeve is harder than either the conductor or the sleeve, and forms a joint that is stronger than the rated breaking strength of the wire itself. **And** it has a high, lasting conductivity.

Single-petticoat insulator has *long* leakage path

You get just about the longest leakage path possible with a single petticoat, on this Hemingray Number 17 insulator for medium length lines. It gives you excellent service through all sorts of weather, protects the pin from moisture, and isn't disturbed by sudden or seasonal changes in temperature.



Long petticoat, small size make the Number 17 insulator highly useful.

It's easy to put up, too, because it has a full 7/16″ square groove, over ⅜″ deep, which provides better support. This means you can work faster, and be sure you are putting your lines up to **stay.**

You save money both ways—on installation time **and** maintenance time.

Paper-insulated Telephone Cable for unsurpassed performance

Kennecott Telephone Cable is made with conductors of 19, 22, 24 and 26 AWG annealed copper wire.

Each wire is insulated with (one or more wraps) of manila paper, or paper made from clear rope stock with suitable proportions of wood pulp or cotton rag stock added.

The paper is wound in helical form around the wire. When two papers are used, they are applied in reverse direction.

Dry paper is used because of its excellent electrical and mechanical properties.

After insulation of the conductors, they are twisted together to form pairs, each wire of a pair being wrapped with paper of a different color for tracing purposes.

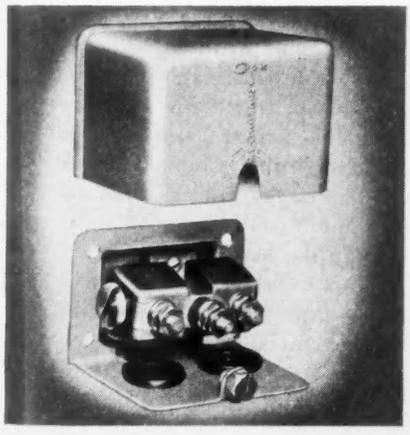
The twisted pairs are cabled together in layers, each layer being one pair thick. Alternate layers are cabled in opposite directions. The complete cable core is taped over with paper.

After removal of moisture by heat and vacuum, the cable is then sheathed with lead containing 1% antimony.

The new Cook "Interceptor"

Lower Maintenance Costs—Sounds good, and it is! It's the new "Interceptor," a fuseless sub-station protector made by Cook Electric Company.

The "Interceptor" contains a Bakelite unit having heavy Everdur bussed circuits and ground studs, insert-moulded. It is compact and employs the protection characteristics of the Mini-Gap carbon-to-carbon arrester. There are two



"Interceptor" fuseless sub-station protector

Mini-Gaps used and they will pass, simultaneously, a current of 30 amperes for 15 minutes without destruction in accordance with Underwriters' requirements.

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NEW OFFICERS of Seyler Manufacturing Co. are (l. to r.): — N. A. TOALSON, vice-president and general manager; WALTER KIRKWOOD, president; F. G. CHANCE, chairman of the board; C. C. HOUGH, treasurer; and R. E. AUSMUS, secretary.

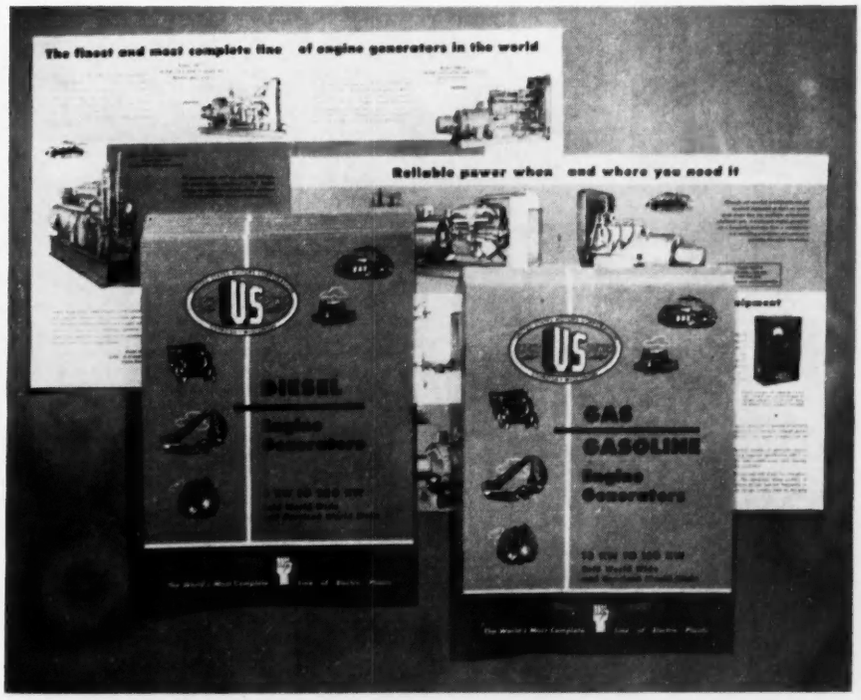
A. B. Chance Company Purchases Seyler Company

THE A. B. CHANCE CO., Centralia, Mo., recently purchased the Seyler Manufacturing Co., Pittsburgh, Pa., according to an announcement by F. Gano Chance, president of the Centralia firm. The Seyler Co., a leading manufacturer of pole line hardware for the electrical and telephone industries, was founded in 1920.

Officers of the Seyler organization now are Chance, chairman of the board; Walter Kirkwood, president; Nathan A. Toalson, vice president and general manager; C. C. Hough, treasurer; and R. E. Ausmus, secretary. Kirkwood has been serving as president of the Seyler Company; the others hold the same titles with the parent firm.

This is the third major acquisition by the A. B. Chance Company in the past two years. The W. N. Matthews Corp. and the Specialty Device Co. were both purchased in 1953.

The A. B. Chance Co. operates manufacturing plants in Centralia, St. Louis and San Francisco in addition to the Seyler plant in Pittsburgh.



UNITED STATES MOTORS CORP. recently announced a complete new line of diesel (5 KW to 200 KW) and gas-gasoline (10 KW to 150 KW) engine generators for both continuous and standby duty. "The new models include engineering and design changes that have been in the process of development for the past six years," explains L. D. Meeker, director of sales, "and many of these changes have resulted in substantial price reductions on specifically rated models." The recently released U.S. Engine Generator line includes portable, mobile and stationary units with adaptations available for individual installations. The entire line is described in two folders available upon request from United States Motors Corp., Dept. TE&M, Oshkosh, Wisc.

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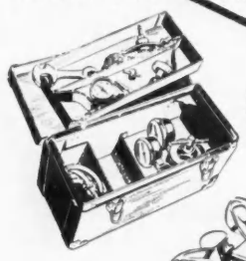
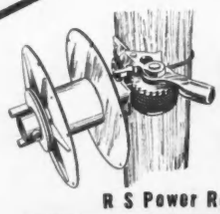
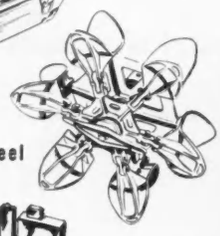
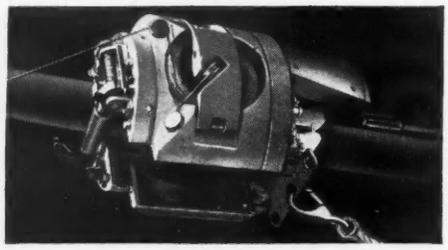
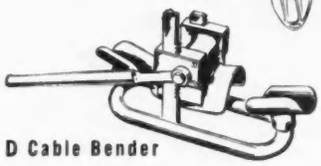

Pressure Testing Kit


R S Power Reel


C R Power Reel

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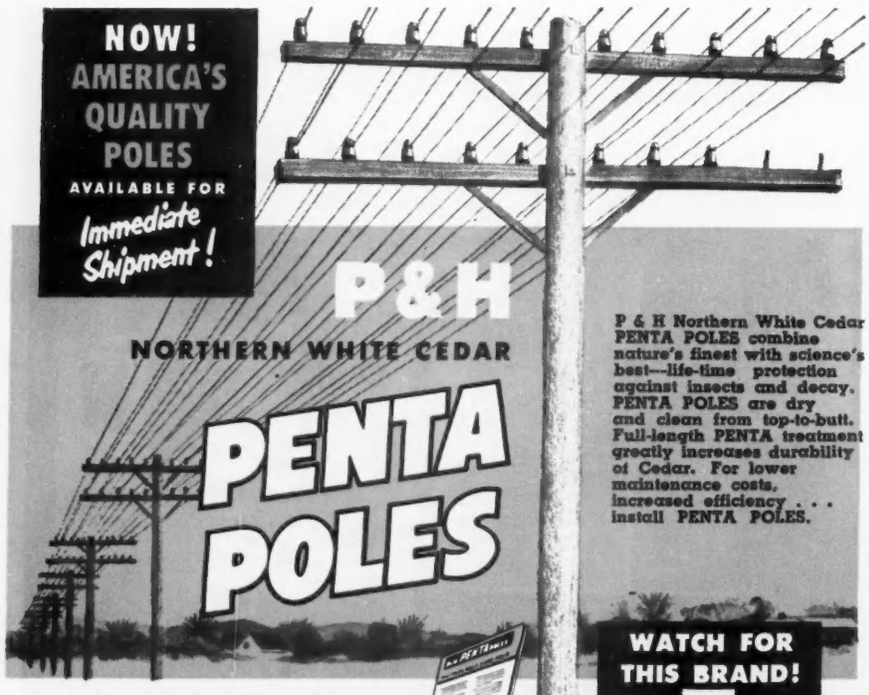

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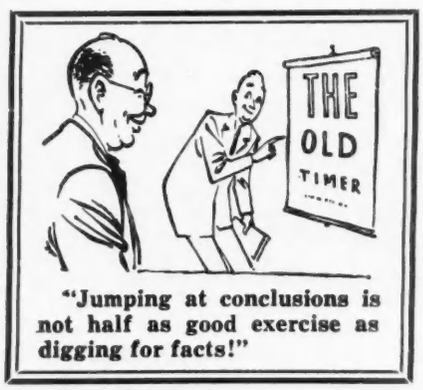
"Watch Dog" For Exchange Cables

THE WISCONSIN Telephone Co. is trying out a new "watch dog" system for spotting leaks in exchange cables. The system, which will alert plant forces to a break in a cable sheath and also protect subscriber lines temporarily, consists simply of forcing dehydrated air into all cables fanning out from a central office.

This is accomplished first by plugging the far end of a cable, then pumping the dry air into the sheath from the other end at the central office until the pressure reaches a certain level. A meter then measures the volume of air going into the cable. A certain amount of air is expected to escape under normal conditions. An undue amount serves as the warning that air is escaping through a break in the sheath. For some time, a similar system using nitrogen gas has been in use in critical toll cables but it is not as practical as dry air for exchange purposes.

The company currently has installed the system in the Madison exchange and in the Bluemound service area of Milwaukee. In the cables, a resin compound called "thiokol" is injected to seal the ends of all cables which are not air tight. In the central offices, compressor-dehydrator machines remove the water content from the air and maintain the desired pressure in each cable. In addition to meters, which will tell only which cable is broken, small alarm devices wired from various points on each of the larger cables serve to further pinpoint any damaged location. While the leak is being located, the compressor-dehydrator will send increasing volumes of air into the cable to maintain the pressure and halt the flow of any moisture into the sheath.



"Jumping at conclusions is not half as good exercise as digging for facts!"

Hoit Re-elected To AMA Postition

GORDON G. HOIT, executive vice president of the Stromberg-Carlson Co., Rochester, N. Y., has been re-elected vice president of the finance division of the American Management Association by its board of directors at the Top Management Conference held recently in New York City. Mr. Hoit recently served as chairman of the AMA Special Electronics Conference which was held in New York City. He also conducted the first financial seminar on the West Coast under the auspices of this group.

GORDON HOIT

Dr. Candy Named Vice Pres. Automatic Electric Laboratories

DR. CHARLES M. CANDY, head of the patent department of Automatic Electric Co., Chicago, has been elected a vice president of Automatic Electric Laboratories, Inc., a subsidiary of Automatic Electric Co. A native of Indiana, Dr. Candy received his engineering education at the University of Nebraska, working part time during his college days as a troubleshooter for the Lincoln Telephone & Telegraph Co.

DR. C. M. CANDY

Dr. Candy joined Automatic Electric Co. in 1913, and after further technical training, was assigned to the patent department. After serving with the U.S. Army Signal Corps during World War I, he returned to Automatic Electric, continued the study of law and was appointed chief patent counsel and head of the patent department in 1920. He is a member of the Illinois Bar and the bar of the United States Supreme Court.

In 1949, Dr. Candy received the Talbot G. Martin award, presented annually by the Strowger Automatic Club to those who have made outstanding contributions to the art of communication. He received the honorary degree of Doctor of Engineering from the University of Nebraska in 1954.

Dr. Candy has several patents to his credit, and has acted as attorney in some 2600 patents filed on behalf

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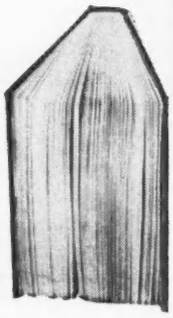

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STEWART BROTHERS
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of Automatic Electric and affiliated companies. He is a member of the committee on patents of the National Association of Manufacturers, and of the committee on relations with the U. S. Patent Office of the American Patent Law Association.

Kellogg Names Aultz Personnel Manager

KELLOGG Switchboard & Supply Company, a division of International Telephone & Telegraph Corp., Chicago, has announced the appointment of Clyde E. Aultz as personnel manager. Mr. Aultz comes to the Kellogg organization with wide and diversified experience and education in industrial relations and personnel management. For the past four years, he has served as director of research and statistics for the National Metal Trades Association, Chicago.

C. E. AULTZ

Previous to 1951, Mr. Aultz was personnel manager of the Davidson Manufacturing Co., Chicago, and before that, associate professor of personnel administration and industrial management at the University of Tennessee, DePaul University and Roosevelt College.

As a Navy Lieutenant in World War II, Mr. Aultz served as fighter director officer on a carrier.

Stromberg-Carlson Elects Bergeson Vice Pres.-Engin'g.

ANDREW H. BERGESON, who retired with the rank of Captain from active Navy duty in 1954 to accept a position as consulting engineer in Stromberg-Carlson Co.'s Washington office, has been elected vice president — engineering.

In this new position Mr. Bergeson will advise with the president and executive vice president on all technical matters and will operate in a general staff capacity as coordinator to all Stromberg-Carlson engineering groups, including research, government electronics, and the engineering staffs sound equipment divisions. He will also serve as official technical repre-

A. H. BERGESON

sentative in liaison with the various military services and with the other divisions of General Dynamics.

Bergeson's record and background of experience in the fields of electronics and communications with the Navy qualify him for this important position with Stromberg-Carlson. He graduated from the U. S. Naval Academy in 1927 with a B.S. degree, and a commission of Ensign. Later he took post-graduate courses at Annapolis in radio, engineering and communications, and at the Harvard University Graduate School of Engineering, where he graduated in 1938 with a Master's degree in engineering.

T. H. Schaffer Heads New Crossarm Association

WEST COAST Crossarm Association, a National Association of West Coast woods crossarm manufacturers, has been established. Sid Levine of Santa Fe Tank & Tower Co., president of the association, stated the association's objectives include pooling technical information, conducting research, collecting industry statistics, establishing and maintaining high quality standards, and the general improvement of the crossarm manufacturing industry. An important function will be to work with the American Wood Preservers Association, Edison Electric Institute and the West Coast Lumberman's Association on matters concerning crossarms.

T. H. Schaffer, Joslyn Manufacturing & Supply Co., was elected vice-president, and G. H. Boyd, Hatheway Patterson Corp., secretary-treasurer.

Charter members of the Association are: American Cross-Arm, Inc., Jacksonville, Fla.; American Crossarm & Conduit Co., Chicago, Ill.; Brooks Lumber Co., Bellingham, Wash.; L. F. Carleton Manufacturing Co., Houston, Texas; R. G. Haley Co., Toledo, Ohio; Hatheway Patterson Corp., Jersey City, New Jersey; Hatheway & Patterson Co., Inc., Mansfield, Mass.; Joslyn Manufacturing & Supply Co., Chicago, Ill.; Pennington Crossarm Company, Chicago, Ill.; and Santa Fe Tank & Tower Co., Los Angeles, Calif.

The West Coast Crossarm Association has retained Trade Association Management firm Byrne Marcellus Company, 332 S. Michigan Avenue, Chicago, Ill., as manager. William E. Smith of the Byrne Marcellus Company will act as Executive Director.

Committees of the Association and

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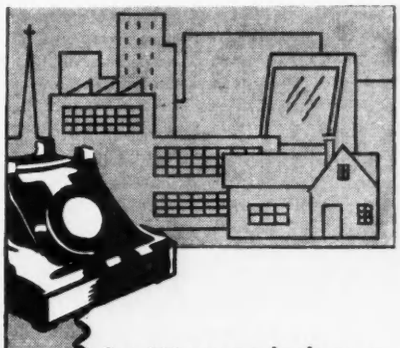

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their Chairmen are: T. H. Schaffer, American Wood Preservers Association, F. A. Masterson, Edison Electric Institute, F. C. Brooks, West Coast Lumberman's Association, and N. D. Stoker, Public Relations.

Personnel Changes Made By Koppers Wood Preserving

THREE ORGANIZATIONAL changes in the Wood Preserving Division of Koppers Company, Inc., have been announced by W. P. Arnold, vice president and general manager of the division.

R. H. Devine, formerly assistant sales manager, has been appointed assistant manager, Eastern District, with headquarters at Wilmington, Dela. Mr. Devine, in addition to his new duties, will retain responsibility for Eastern District railroad accounts.

Effective at the same time is the appointment of J. W. Sullivan, formerly manager of the Colorado District, to the position of assistant sales manager of the Wood Preserving Division. Mr. Sullivan's responsibilities will include both the railroad and commercial fields.

Also announced, is the elimination of the Colorado District, which has been integrated with the Texarkana District which is under the supervision of S. S. Curtis, district manager.

Stromberg-Carlson Names Foote To New Post

HOWARD L. FOOTE has been appointed staff assistant to A. H. Bergeson, vice president in charge of engineering at Stromberg-Carlson, a division of General Dynamics Corp., according to an announcement made by Mr. Bergeson.

In his new capacity, Mr. Foote will act as executive secretary of the new Research & Development Technical Committee at Stromberg-Carlson. In addition, he will be responsible for project analysis and various technical matters of this office.

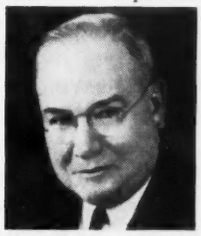
Mr. Foote was born in Rochester, New York; attended Fairport, New York, grade and high schools before entering Cornell University, where he graduated in 1943 with a B.A. degree in physics. For two summers during his college years, he worked at Stromberg-Carlson in the Physical Testing Laboratories, and returned there upon graduation.

Following two years of service as an aviation electronics technician with the U. S. Navy in World War

II, Mr. Foote returned to the Stromberg-Carlson Research Laboratory doing work on miniaturized, hermetically sealed range receiver for the U. S. Navy, and airborne wire recorder for the U. S. Air Force. He also spent three years as technical publications editor. Recently he has worked with the Wire Communications Group in the development of toll ticketing equipment.

Harry McCluskey Retires From Kellogg Swbd. & Supply

HARRY C. MCCLUSKEY, executive vice president and treasurer of Kellogg Switchboard & Supply Co., a division of International Telephone & Telegraph Corp., and well known in Independent telephone circles, "hung up the receiver" on 28 years in the communications equipment-manufacturing business on August 26. James H. Kellogg, president of Kellogg, announced that Mr. McCluskey will continue as a member of the Kellogg Management Advisory Board.



HARRY McLUSKEY

"We who are engaged in the operation of the business realize we are losing a knowledgable co-worker and a genial friend," President Kellogg said. "All of us join, I am sure, in wishing 'Mac' great happiness and 'smooth sailing.'"

Mr. McCluskey joined the Kellogg company in 1927 as comptroller and assistant treasurer; he was appointed treasurer in 1936. In 1946, he was elected executive vice president and a director of the company. He also served for several years as president of Telephone Sales & Service Co., New York City, formerly a Kellogg subsidiary.

Mr. McCluskey is well known in accounting circles; he has served as president of the Chicago Chapter, National Association of Cost Accountants, and as a vice president of the national association. Recently, he served a term as president of the Spot Club, an organization composed of past national officers of the NACA. The Kellogg executive also holds membership in the American Institute of Accountants.

Before joining the Kellogg company, Mr. McCluskey was comptroller and assistant treasurer of the York Safe & Lock Co., York, Penna. Prev-

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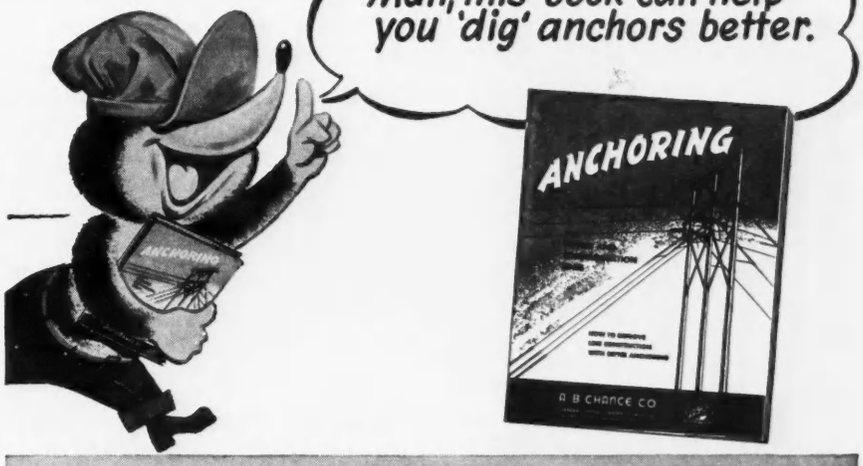

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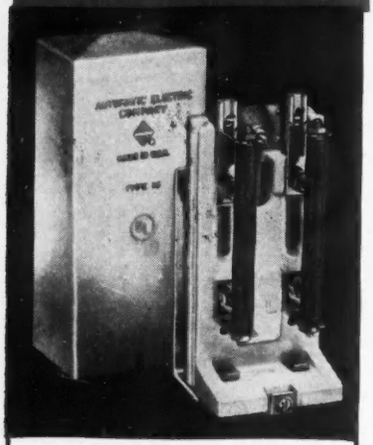
AUTOMATIC'S TYPE 18 SUBSTATION PROTECTOR



He's the man you *don't* have to send out to replace discharge blocks on Type 18 Protectors. Type 18's blocks ground themselves to prevent the "burnaway" that causes maintenance trips. They are also self-clearing.

Type 18's quick, economical installation will bring you additional savings, as it has to many other telephone men. Twin-screw mounting and easy-to-reach terminals are the reasons. Type 18 gives long service, too. Its snug-fitting aluminum cover keeps out dust and rain; its heavy porcelain base takes hardest knocks.

Order Cat. No. SB-18
Fuse 7 amp.
Dimensions 2-3/4" x 7-1/2" x 2-3/4"
Shipping Wt. 2-1/4 lbs.

Address:
Automatic Electric Sales Corporation, 1033 *W. Van Buren St., Chicago* 7.
Or, call HAymarket 1-4300.

FEATURING THE "DOLLAR-SAVER" DISCHARGE BLOCK

AUTOMATIC ELECTRIC

ORIGINATORS OF THE AUTOMATIC DIAL TELEPHONE

ious to that time, he was a certified public accountant with Lybrand, Ross Bros. & Montgomery, New York City.

During his career with Kellogg, Mr. McCluskey has been prominent in the affairs of the Clearing Industrial Association, composed of approximately 150 manufacturing companies in the Clearing Industrial District. He served two terms as president of the association and was a member of the board of directors for several years.

Exide Names Dean Manufacturing Mgr.

OAKLEY N. DEAN has been named manufacturing manager, Exide Industrial Division of The Electric Storage Battery Co., Philadelphia, Pa.

Dean, manager of the division's manufacturing operations in Philadelphia since 1952, succeeds Wallace E. Nyce, who retired June 30 after 43 years with the company. He assumes responsibility for all industrial battery manufacturing operations, plant engineering, industrial engineering and purchasing for plants in Boston, Chicago, Detroit, Philadelphia and San Francisco.

O. N. DEAN

Beginning his service in 1933, Dean was employed in Toronto as a chemical engineer by Willard Storage Battery Co. of Canada, Ltd., a subsidiary of The Electric Storage Battery Co. From 1946 to 1949 he was a sales engineer and technical assistant to the executive vice president of the Canadian company.

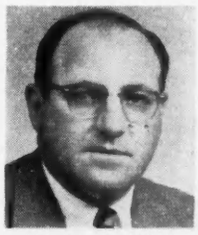
He was transferred in 1949 to Philadelphia and promoted to assistant superintendent of the plant at 19th Street and Allegheny Avenue. As assistant to the general superintendent in 1950, Dean was in charge of transferring the Allegheny Avenue plant operations to the plant at Rising Sun and Adams Avenues in Northeast Philadelphia during the Exide industrial modernization program. He held the post of assistant superintendent in 1952.

Ralph Hopkins Joins Highway Trailer Co.

HAROLD J. MEAGHER, president of Highway Trailer Co., Edgerton, Wisc., has announced the appointment of Ralph C. Hopkins to the

position of sales manager of the company's Utility Division.

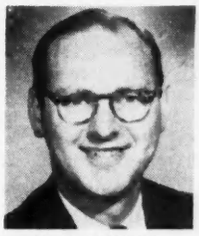
Mr. Hopkins matriculated at the University of Wisconsin and received his degree in mechanical engineering at the University of Connecticut. Before joining Highway Trailer Co., he was employed by United Aircraft Co. — Hamilton Standard Propeller Division, East Hartford, Conn., for five years as a field sales and service engineer and for 10 years by the Four Wheel Drive Auto Co., Clintonville, Wisc., as a sales engineer and Western sales manager. Mr. Hopkins also handled sales for the Eagle Manufacturing Co., a subsidiary of Four Wheel Drive Auto Co., which manufactures products for the public utility and construction fields.



R. C. HOPKINS

Exide Names Snyder Advtg. & Sales Promotion Mgr.

T. E. SNYDER has been appointed manager of advertising and sales promotion of Exide Industrial Division of The Electric Storage Battery Co., Philadelphia, Pa. Snyder, who previously was executive director of Americans for the Competitive Enterprise System, Inc., (ACES) in the Pittsburgh, Pa., area, takes over duties which were assigned temporarily to E. J. Fitzmaurice, Jr., sales engineering manager of the division. The realignment, according to C. J. Moore, sales manager, is part of a plan to intensify sales efforts through product development under Fitzmaurice and promotional activities under the new appointee.



T. E. SNYDER

From 1948 to 1954 Snyder was editor of MEN AND STEEL, an employe publication, and assistant to the director of public relations and advertising of Jones & Laughlin Steel Corp., Pittsburgh. He once was advertising manager of Alliance (O.) Rubber Co. and a partner in an advertising agency. He also did advertising production and sales contact work for several Pittsburgh firms. During World War II he was a flight dispatcher for Pennsylvania Central Airlines (now Capital Airlines).

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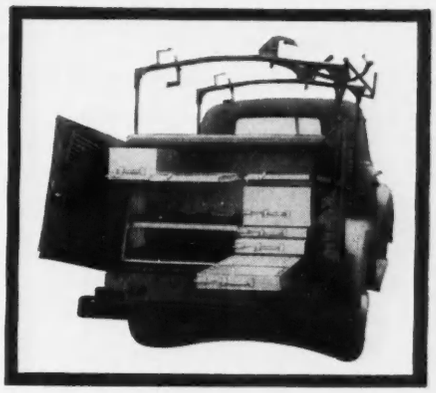

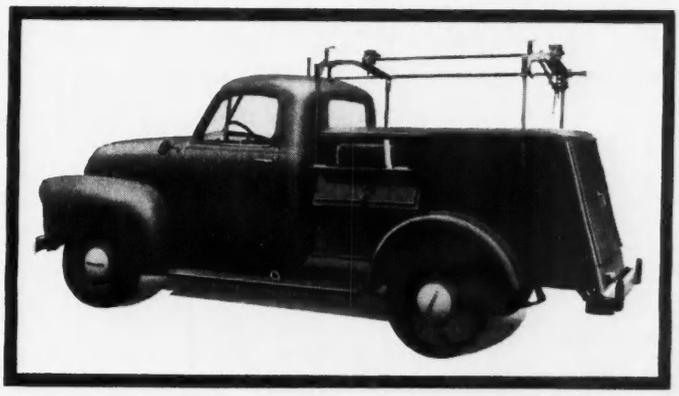

Latest type ladder bracket, adjustable partitioned drawers.

Left side view showing readily accessible extra tire compartment.

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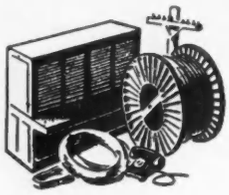
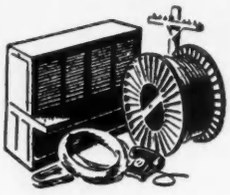
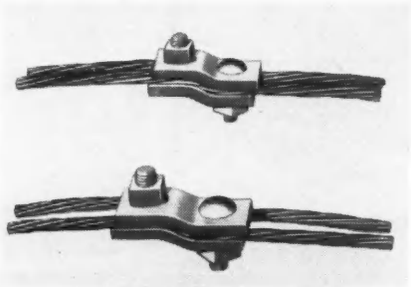




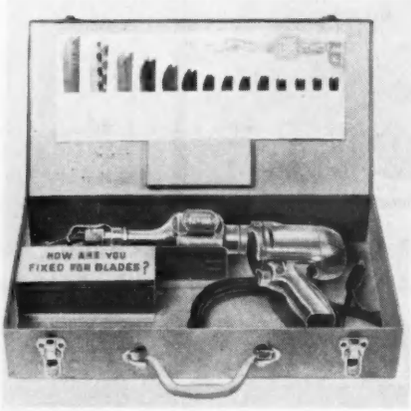


Offset Guy Clamps

NEW OFFSET Guy Clamps, developed by Line Material Co., are available in two sizes — one accommodating 1/4- to 3/8-inch diameter strand, and the other accommodating 5/16- to 1/2-inch diameter strand.

These low-cost galvanized steel clamps develop holding power in excess of the breaking strength of the strand. The new design simplifies installation and reduces installation time by having only two high-strength track bolts with Torkol-treated nuts.

For further information write Line Material Company, Milwaukee 1, (Dept. TE&M), Wisc. or ***Check New Product* 853.**



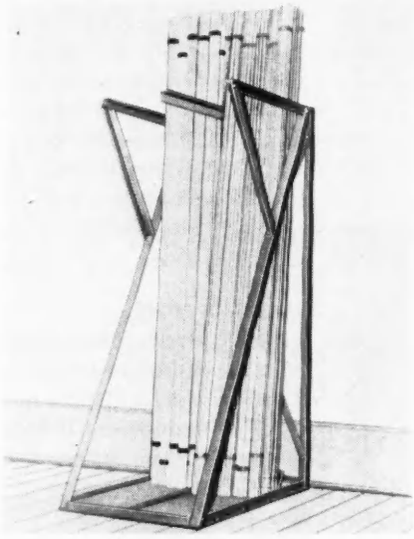
Portable Electric Hack Saw

A NEW HEAVY-DUTY, self-powered, portable, electric hack saw, designed for making straight, circular and random cuts in practically any material, including wood, stainless steel, tempered aluminum and mild steel has been announced by the Key-Hak Division of Producers & Distributors, Inc. According to the manufacturer this unit cuts nine times as fast as a hand hack saw.

This compact, self-contained unit measures 15-1/2″ overall and weighs 6-3/4 lbs., permitting it to be used in close quarters. The forward positioning of the pistol grip handle provides excellent balance, easy maneuverability and affords complete control when making cuts in any direction. With this new Key-Hak all 360° cuts can be made without changing hand positioning.

Strict adherence to "in-line" design permits the operator to make clean cuts to close tolerances. Edge dressing is unnecessary, as the powerful, high-speed reciprocating action (2500 strokes per minute) provides a burr-free edge.

A 9/16″ diameter shaft and extra heavy construction throughout adapts this new tool to jobs formerly beyond the capacity of portable tools of this type. Three ball bearings in the drive and crank mechanism assure smooth operation and long life, and this mechanism is sealed in a special lubricant which protects all moving parts.—For complete data, ***Check New Product* 854.**



Vertical conduit rack.

Conduit Racks

STORAGE OF large quantities of electrical conduit and other piping material is now possible in a much smaller space using new vertical Conduit Racks, it is announced by the manufacturer, The Frick-Gallagher Manufacturing Co., Wellston, Ohio.

Lengths of conduit up to 10 feet can be stored upright in these racks which eliminate the need for extra wide aisles. Withdrawing of materials is also made easier by the convenient vertical position.

These racks are individual units, require no fastening to the floor nor bracing to walls or ceiling. Being anchored by their own weight, they become more stable as load is increased. Each rack is a separate unit and provides 9 sq. ft. of usable space for conduit storage. Racks may be placed singly or in rows or back to back.

To expedite shipping and receiving of conduit, racks may be bolted to a pallet and readily transported by industrial truck, thus retaining advantages of vertical storage during transit. Made of steel, racks are 36″ wide, 48″ deep, and 8′ high.

Descriptive information may be obtained from The Frick-Gallagher Manufacturing Co., Dept. TE&M, Wellston, Ohio, or by ***Checking New Product* 855.**

"Flash-Flare"

EXCAVATIONS and other danger spots around telephone and electric line installations may be clearly mark-

ed without the necessity of building barricades if a new "Flash Flare" electric flare developed by Buffalo Weaving & Belting Co., Alliance, Ohio, is used.

The new flare has passed all requirements of Electrical Testing Laboratories, Inc., New York, for vibration, moisture, dust, corrosion, reliability and visibility.

The visibility test showed the Flash Flare to be plainly visible and attention attracting at 1500 feet, the longest straight distance available for the test. This is more than twice the normal requirements. Further tests show that the flasher will operate 22 continuous hours without loss of brilliance.

Increased intensity of the light and the 19-inch height of the new patented cone-shaped flare account for this greatly improved visibility. The cone is designed with a series of rings from which the light is projected outward as it travels up the cone from the bulb. From a distance, the rings of light blend to make the flare as bright at the top of the 19-inch height as it is near the base.

The steel base of the flare is heavily weighted so that the flare will not topple in heavy winds. It holds a standard six-volt battery and lantern bulb for which replacements can be secured anywhere lantern bulbs and batteries are sold.

Buffalo Weaving and Belting is packaging the flare singly or in sets of three.—For complete data, ***Check New Product 856.***

Spray Line Kit

A NEW AEROSOL product has been announced by Crown Industrial Products Co., 1105 Amsterdam St., (Dept. TEM), Woodstock, Ill.

The new product called the Crown Spray Line Utility Kit consists of four 6 oz. aerosol (spray type) cans. An individual can for each of the following products — The New Crown Lubricating Oil, Penetrating Oil, Rust Inhibitor and All Weather Clear-Coat.

These aerosol products enable the operator to spray any of these materials in and around the inaccessible places not ordinarily reached, giving an all-over coverage.—For complete data, ***Check New Product 857.***

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ADV. 21..... ADV 22.....

THE BUYERS' GUIDE

ADVERTISING, Directories — *General Telephone Directory Co., 1800 Busse Highway, Des Plaines, Ill.*—[ADV. 1]

BELTS — CLIMBERS — COMPLETE LINEMEN'S EQUIPMENT, *W. M. Bashlin Co., Bashlin Bldg., Grove City 1, Pa.*—[ADV. 2]

BELTS — CLIMBERS — PLIERS — SAFETY STRAPS — CONSTRUCTION TOOLS. *Klein & Sons, Mathias. 3200 Belmont Ave., Chicago 18, Ill.*—[ADV. 3]

BOOTHS—Acoustic Telephone — *Sherron Metallic Corp., 1202 Flushing Ave., Brooklyn 6, N. Y.*—[ADV. 4]

BRUSH & WEED KILLERS — *Thompson manufactures many types of brush and weed killers. Write for helpful information on specific problems. Thompson Chemicals Corp., St. Louis 3, Mo.*—[ADV. 5]

CABLE, All Plastic, Aerial, Duct, Direct Burial, PBX, Switchboard. — *The Ansonia Wire & Cable Co., Ansonia, Conn.*—[ADV. 6]

CORDS, Switchboard (with or without plugs), Instrument (retractable and regular) and Operators — *Commercial Cord & Supply Co., Inc., 26 Main St., Clifton Springs, N. Y.*—[ADV. 7]

CORDS, Switchboard & Telephone — *Runzel Cord & Wire Co., 4727-31 Montrose Ave., Chicago 41, Ill.*—[ADV. 8]

FURNACES — For quickly and economically melting lead and paraffin — *Mutual Liquid Gas Equipment Co., Inc., 3600 W. Imperial Highway, Los Angeles, Calif*—[ADV. 9]

INSULATORS, Porcelain — *Porcelain Products Inc., Box 300, Findlay, Ohio.*—[ADV. 10]

LIGHTWEIGHT PULLERS — *Coffing Hoist Company, 800 Walters St., Danville 5, Ill.* —[ADV. 11]

PIPE PUSHERS — *Giant Manufacturing Co., South 6th St., at 12th Ave., Council Bluffs, Iowa.*—[ADV. 12)]

POLE HOLE DIGGERS — *For derrick mounted trucks. Tele-E-Lect Products, Inc., 9613 Minnetonka Blvd., Minneapolis 16, Minn.* —[ADV. 13]

POLES, Southern Yellow Pine — *Colfax Lumber & Creosoting Co., Inc., P. O. Box 23. Pineville, La.*—[ADV. 14]

POLES, Southern Yellow Pine — *Taylor Colquitt Company, 290 E. Main St., Spartanburgh, S. C.*—[ADV. 15]

POLES, Southern Yellow Pine — *Texas Creosoting Co., Orange, Texas.*—[ADV. 16]

PROTECTIVE EQUIPMENT — *Reliable Electric Company, 3145 Carroll Avenue, Chicago 12, Ill.*—[ADV. 17]

REBUILT TELEPHONE & SWITCHBOARDS — *Telephone Repair & Supply Company, 1760 Lunt Avenue, Chicago 26, Ill.*—[ADV. 18]

TRUCK BODIES — *Highway Trailer Co., Edgerton, Wisc.*—[ADV. 19]

WIRE, Insulated — DATED DROP WIRE — Neoprene or Weatherproof — *Alphaduct Wire & Cable Co., Milltown, N. J.*—[ADV. 20]

WIRE, Insulated Drop and Bronze or Copperweld — *Acorn Insulated Wire Co., Inc., 36 Freeman St., Pawtucket, R. I.*—[ADV. 21]

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HELP WANTED: — Midwest Independent telephone company serving approximately 15,000 stations, needs young man between ages of 30-40 for position as assistant general manager. Position requires business administration background and experience in labor negotiations, personnel work. Send resume of educational and experience qualifications and salary requirements to Box 8962, TELEPHONE ENGINEER Publishing Corp., 7720 N. Sheridan Road, Chicago 26, Illinois.

HELP WANTED: — Midwest Independent telephone company serving approximately 4,000 stations has opening for central office equipment maintenance man with experience in maintaining Strowger automatic equipment.
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CABLE LASHERS: General Machine Products Type B, good used; complete with chest and tow rope. $95.00 F.O.B. Chicago. Quantity Limited. Line Equipment Sales, 529 S. Dearborn Street, Chicago 5, Ill.

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Stromberg-Carlson Transfers Gaydos to Atlanta, Ga.

GERALD C. GAYDOS has been transferred to the Atlanta sales office of Stromberg-Carlson Co. from the Chicago sales office, according to T. C. Thompson, sales manager of the Telephone Division. His transfer to Atlanta, where he will serve as order editor and correspondent, is in line with that office's current expansion program.

G. C. GAYDOS

Mr. Gaydos received his early education in Chicago and later majored in business administration in Wilson Junior College. Before joining Stromberg-Carlson's Chicago office in 1949, he was associated with the Reliance Manufacturing Co. and Podbielniak, Inc.

Ward Leonard Appoints New Jersey District Mgr.

WARD LEONARD ELECTRIC CO., Mount Vernon, N. Y., manufacturers of electric control components and equipment, has announced the appointment of C. J. Penza as district manager of its Millburn, N. J. office located at 511 Millburn Ave. A graduate engineer of Tri-State College, Mr. Penza has been associated with the electrical industry for several years before joining Ward Leonard in 1951 as a Sales Engineer.

New Book Tells History of Minnesota Mining & Mfg. Co.

THE STORY of industrial abrasives, tapes, and adhesives, now playing a bigger part than ever before in the production of electrical machinery and equipment, is told in a new book, "Brand of the Tartan."

This 250-page volume by Virginia Huck traces the history of 53-year-old Minnesota Mining & Manufacturing Co., developers of special abrasives, adhesives, and many other products. It is published by Appleton-Century-Crofts, Inc., at $3.50.

Behind the development of such products are the same qualities — imaginative research, venturesome capital and progressive management — that have made the company a classic example of free enterprise in action, the book says.

In a chapter called "The Great Depression: A Golden Era" the book describes the steps that led to the present place enjoyed by special tapes in the electrical machinery field.

The research integral to the development of this product is typical, the book says, of 3M's never-ending search for better raw materials, better tools and better ways to make everyday jobs easier, faster, safer.

In the past, the book points out, the men of 3M created new wealth, new products and new jobs from their ideas, determination and capital, thus enriching the whole nation.

In the future, too, the book predicts, the company will continue to work on many new frontiers, and like all outstanding growth companies, it will explore tomorrow's wants today with the same desire to serve these needs as soon as possible.

Harold Miller Joins Kellogg Swbd. & Supply

O. C. BAILEY, assistant sales manager of Kellogg Switchboard & Supply Co., a division of International Telephone & Telegraph Corp., has announced the appointment of Harold T. Miller as a field representative.

Mr. Miller spent 14 years with the Ohio Bell Telephone Co., Kent, Ohio, as a central office repairman, and four years with the Alaska Communications System, Anchorage, Alaska, as chief non-commissioned officer in charge of maintenance of radio and wire facilities to the surrounding islands and isolated posts.

Mr. Miller will travel the West Virginia and southern Ohio territories of Kellogg's Central Division, under the supervision of C. E. Brown, division manager. He will headquarter at Kellogg's Branch Office and Warehouse in Mansfield, Ohio.

FOR MAGNETO SWITCHBOARDS

W. E. #22-C Combined Jacks and Signals on #89-B Mounting (5 per strip) *NEW*
S. C. #350-B Combined Key and Supervisory Drop Assembly (Replaces #169-F Key) *NEW*
Federal #804-A Magneto Handsets for Desk or Wall Mounting—*RECONDITIONED*

BUCKEYE TELEPHONE & SUPPLY CO.

1250 Kinnear Road Columbus 21, Ohio
HUdson 8-0655

The stormiest weather is a breeze for Armstrong Glass Insulators. They're made of tough industrial glass that stands up to punishing line strains and severe thermal shock. For full details on these rugged insulators, write direct to Armstrong Cork Company, 295 Fifth Ave., New York 16, N. Y.

Armstrong GLASS INSULATORS
for communications . . . for power

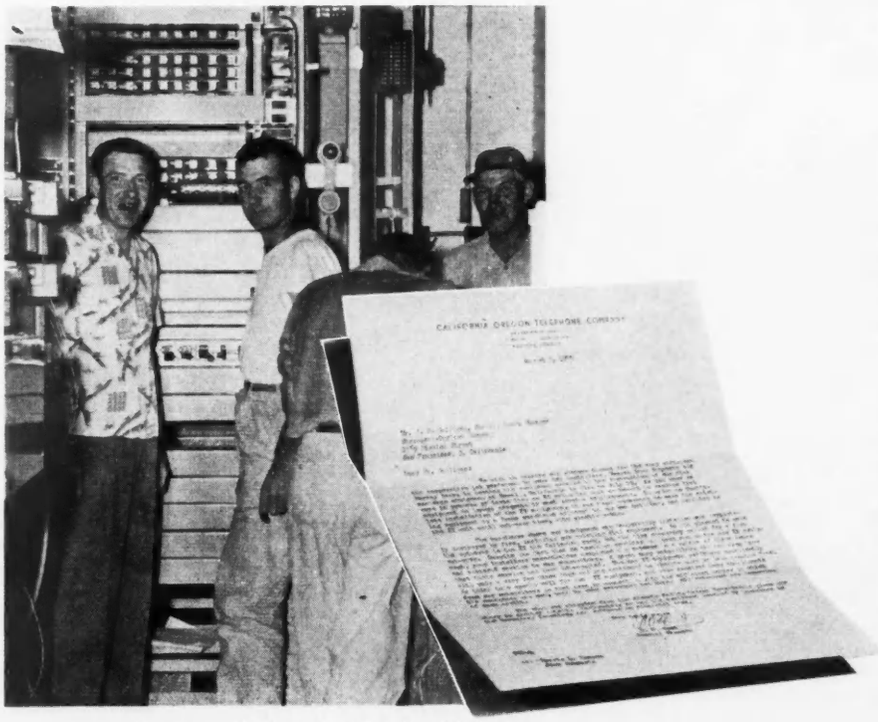
STROMBERG-CARLSON®

transmitter

Published by the famous makers of XY® Equipment

VOL. 4, NO. 6 SEPTEMBER, 1955

Newell, California, subscribers continue dialing . . . Many unaware central office destroyed by fire.



Courtesy of Klamath Falls Herald News

These men labored well to keep service going. L.-R., Jack Schwartz and Murrel Beck, Stromberg-Carlson installers, George Mattson and Floyd Whitlatch of the California-Oregon Telephone Company.

Fire — nightmare of every telephone manager — completely destroyed the building and central office equipment of the Newell exchange of the California-Oregon Telephone Company. So well was this situation met that, according to a letter received from Mr. D. O. Hood, general manager, "a great many subscribers did not even know that their service had been interrupted."

This remarkable example of service above and beyond the call of duty is related by Mr. Hood in a letter to J. P. Galligan, Pacific Coast manager for Stromberg-Carlson Company.

"As you know, we were in the process of installing an XY® switching unit at Newell to replace dial equipment no longer adequate to meet service requirements. In order to facilitate installation of the XY equipment, it was found necessary to move the existing equipment to a frame warehouse adjacent to our own building . . . the warehouse . . . was completely destroyed by fire July 29."

Mr. Hood further related that the new XY equipment, while in place, had not yet been tested or routined, since cut-over had not been planned until the following week. In view of the emergency, it was decided to place the new, untested equipment into immediate service. Within three hours the cut was made, and service had been restored to the subscribers.

Three hours, when four men — George Mattson and Floyd Whitlatch of the California-Oregon Telephone Co., Jack Schwartz and Murrel Beck of the Stromberg-Carlson Installation Department — pitted their knowledge and skill against the unknown equation of how complete a job they had already accomplished. Mr. Hood, speaking both for the subscribers and the telephone company, commended these men most highly for the very efficient and cooperative manner in which the emergency was met.

It's another example of the "Telephone Tradition" — a way of living which sees the job through first, then weighs the risks. Mr. D. O. Hood and his men, who have met their emergency so admirably, would be among the first to wish well to brave men at Myrtle Beach, South Carolina who — barely recovered from the devastation of Hurricane Hazel last fall — are heroically meeting the challenge of the present holocausts. And to the heroic men and women of the Northeast who, forgetting self, battled floods to keep the wires open.

STROMBERG-CARLSON *transmitter*

The Telephone That Can Raise Its Voice . . .

Problem: telephoning in noisy areas.

Answer: a remarkable telephone that can be a tremendous revenue-builder for you.

You can't hear yourself think in some areas of the Stromberg-Carlson manufacturing departments.

For example, in the punch press department, a 300-ton machine slices telephone parts out of solid sheets of metal. The floor shakes, and the din is ear-shattering.

Suppose you want to talk to someone in that department. How in the world can he hear you on the telephone?

The answer is a type of telephone that cuts out distracting sounds and amplifies both voices in the conversation.

It is called the GAI-PHONE (pronounced "Guy-phone"). It is a standard Stromberg-Carlson "1500" Series telephone to which has been added an independently powered sound reinforcing system. This amplifier does three things:

1. It amplifies transmission, so that a party speaking from a noisy location can be clearly heard. Because the GAI-PHONE has a special pressure-differential, dynamic transmitter, it provides a high order of discrimination against surrounding noise, as well as high quality voice transmission.

2. It amplifies incoming signal, making it possible for the person in a noisy area to hear clearly. He does not have to move into a soundproof booth or shut off the machinery in order to carry on an intelligible conversation.

3. It provides control of sidetone. Sidetone may be adjusted to varying degrees, or entirely eliminated, in the GAI-PHONE. This adds to its usefulness in cutting out distracting noises when conversing in extremely heavy noise areas.

All three of the functions are variable, operated by volume controls located in a concealed position on the telephone and set with a screwdriver.

Boon for Factories

The GAI-PHONE eliminates need for soundproof booths, which are often expensive, space-hogging, and uncomfortable.

Solves other Problems

With its electronic amplification, the GAI-PHONE enables you to solve a number of special problems. For example:

For long lines, you can use it as a terminal repeater, which amplifies both the transmitted and the received portions of the conversation. This

Noisy areas, such as this power generating plant or the metal working shop at left, no longer present a telephone problem when GAI-PHONE is installed.

eliminates the need for power boost along the line.

As a special phone for hard-of-hearing people, the GAI-PHONE provides needed boost for the receiver, while keeping transmission volume at a normal level.

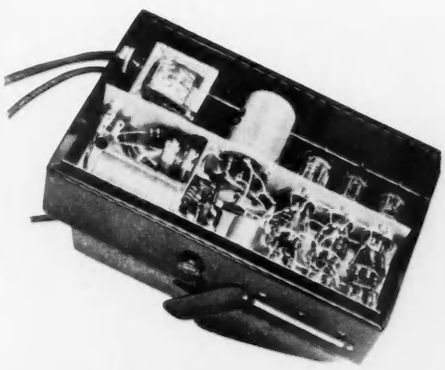
Simple operation

Installing and operating the GAI-PHONE is easy. You connect it into your existing telephone circuit exactly as a standard telephone station (or PBX station). It can be equipped for either dial or manual operation, and may be either desk or wall-mounted.

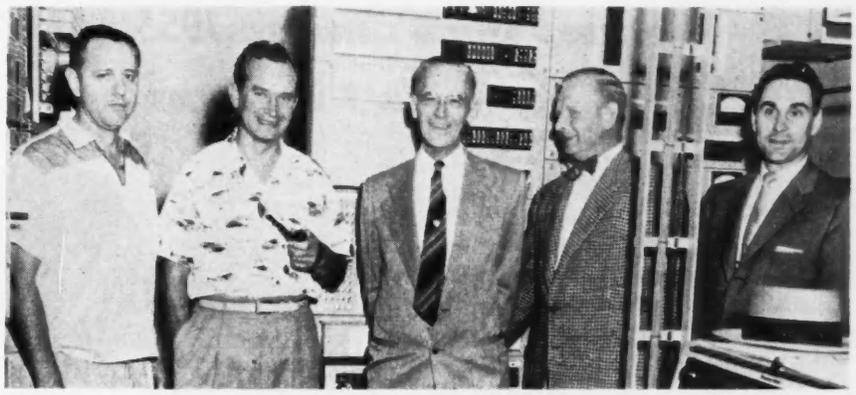
A standard electrical outlet, providing 110 volts, 60-cycle AC is required for the sound amplifying system. This power supply is completely isolated from the telephone circuit.

The 'phone requires only a small amount of power — so little that it could actually be operated by a small DC inverter, such as you would use to operate an electric shaver from the cigar lighter socket in your car. This low power requirement makes the GAI-PHONE ideal for temporary lines, where reliable communications are difficult, and a small amount of power is available.

To keep maintenance to a minimum, the GAI-PHONE uses many of the standard components included in all Stromberg-Carlson telephones. In addition, the electronic elements are engineered for long life and ruggedness. The electronic tubes are only required to operate at ½ of their normal voltages, a fact which further reduces maintenance needs.



Electronic amplification of sound and adjustable sidetone are made possible by a separately powered unit in base of GAI-PHONE.



At Dos Palos cutover: (l. to r.) Richard D. Crowe, general manager at Dos Palos; Donald H. Strahl, manager of Gilroy Telephone Co.; A. A. Harrington, owner Livingston Telephone Co.; John Evans, manager Evans Telephone Co. at Patterson; Ken Terry, Stromberg-Carlson.

Californian, Planning New Cutover, Tells VP in D.C. about XY

A nationally prominent voice broke over the loud-speaker one May day in the Dos Palos (Cal.) Telephone Co. offices.

"This is Dick Nixon talking. How are things in California?"

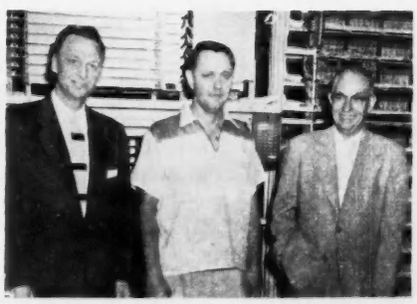
And for the next 15 minutes, vice president Nixon learned that things are swell in California. His informant was Richard Crowe, general manager of the telephone company, and newly elected president of the California Association.

He told of many wonderful things — of a telephone company that is bringing modern telephone service to the residents of a 300-square-mile area that is bounded by landmarks bearing picturesque names like Hammond's Ranch, Sunset Cotton Gin and the San Joaquin River.

The occasion for this transcontinental 'phone call was the 20th birthday of REA, and VP Nixon was calling from a special birthday party in Washington. The Dos Palos company was engaged in an expansion program made possible through the REA, so a friendly chat was in order.

Slightly over a month after this conversation, Richard Crowe saw another of his company's dreams come true. With four new buildings constructed, a new outside plant, and three new switchboards, the Crowe family was ready to cut over their spanking new 500-line XY® Dial System. On June 18, surrounded by well wishers, they completed the cutover and won the immediate cheers of a grateful public.

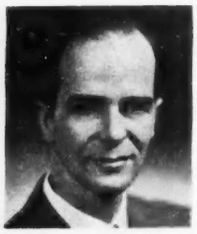
Results: About 400 held orders will now be filled with telephones, bringing the company's present size to 2,000 stations. The company anticipates a potential of 4,400 stations — and their XY System is ready to expand when needed.



From left: Ken Johnson, Stromberg-Carlson representative; Richard D. Crowe; Lawrence Leonard, president Dos Palos Telephone Co.

Man in dark shirt, seen testing numbers, is Horace Jones, chief of toll transmission for the Pacific Tel. and Tel. Co. at Merced. He came to help at Dos Palos. At left is R. D. Crowe, at right is contractor Ray E. Gow.

STROMBERG-CARLSON transmitter



George B. Forbes

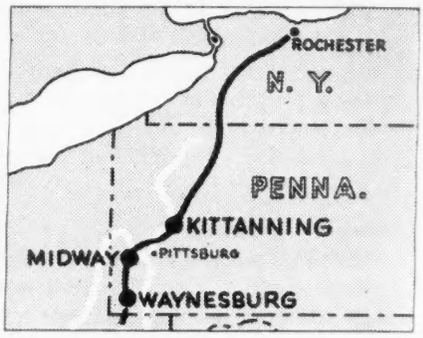
The Postman's Holiday: 1955

No. 1 in a Series

Up until the last minute it was a real question: would all our bags and duffle fit in? which office jobs had to be sweated out, and which given to others? and then of course there was the garden and the two cats!

(Not too) Early on June 29 your editor and family threaded the station wagon between the hordes of neighbors' children and the second *Postman's Holiday* had begun. We hope readers who followed our journeyings of 1953 will be on board again this year.

The family: Lee, Fred, Angeline . . . and the start of the trip.

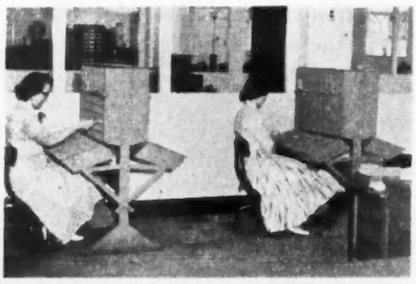


Kittanning, Pennsylvania: industrial beehive north of Pittsburgh and the bailiwick of K. Ben Schotte, Jr., currently president of the Pennsylvania Independent Telephone Association.

Ben Schotte relaxes for a moment. New office will be shown with pride.

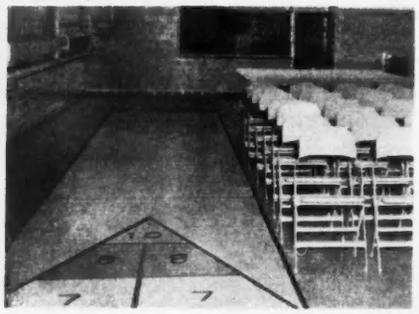
Ben was out when we arrived. Extremely interested in boys, he is guiding spirit behind the Little League baseball in the area — says he hasn't missed a game. Needless, to say, Little Leaguer Fred found much to discuss with Ben as we made plans for the next day.

Ben Schotte was the first to place an XY® Dial System in service many years ago. Standardizing on this equipment throughout his many ex-



In new offices the latest type business furniture and machines speed work.

Recreation for employes was high on Mr. Schotte's priority list — Large social room has every convenience.

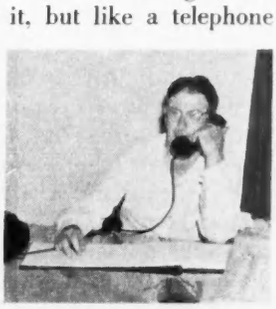


changes, and with his central office program completed for the time being, his present concern is to modernize the administrative and maintenance facilities. A vast and beautifully landscaped building serves as garage and plant headquarters. The main office showed the promise of greater efficiency in delightfully pleasant surroundings.

When this program is completed, Ben will come up with some new ideas — perhaps revolutionary, for here is a man who is always ready to be a leader.

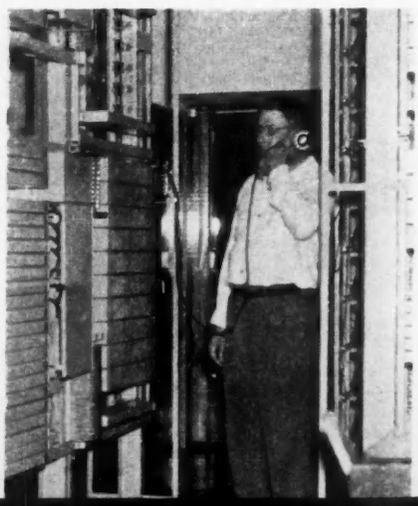
* * * * *

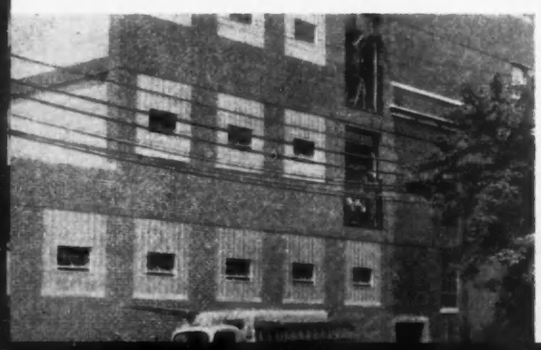
Pittsburgh traffic! The city feels its growing pains and is doing something about it, but like a telephone company trying to maintain full service during a conversion, it's a little hard on everyone. But just a little west of the Steel Capital is *Midway* where Joseph Matchett and his wife immediately invited us into their cool living room.



Joseph Matchett of Midway, Pa. Below, a portion of his 800-line XY office.

We chatted about coal — it's 'most





Exterior shows additions to main office as system has grown. Company truck winch and outside pulley moves in piece of bulky equipment.

STROMBERG-CARLSON **transmitter**

Coal-washing plant at Midway.

gone now except for marginal strips, but one of the area's largest coal washing and distillation plants is served by his telephone exchange. About growth — from a magneto switchboard and 192 stations in 1936 to an 800-station XY office affording direct inward operator toll dialing through Pittsburgh. About the future — Joe Matchett is on a planning board trying to bring new industry to the area. And when it comes, Joe and his company are ready.

Lush farms were all about us — the coal and gas is still plentiful but underground here — as we moved south. At *Waynesburg* — 6,700 population and the county seat — Ralph B. Scott, manager of the South Penn Telephone Co., gets a good start on the day's work while some are still at breakfast. It's a big job he's doing, for his 13 exchanges blanket the county; over the years the Bell Co. has been in and out, but the greatest advancements have come under independent management, with a total of 11,300 subscribers in 1953.

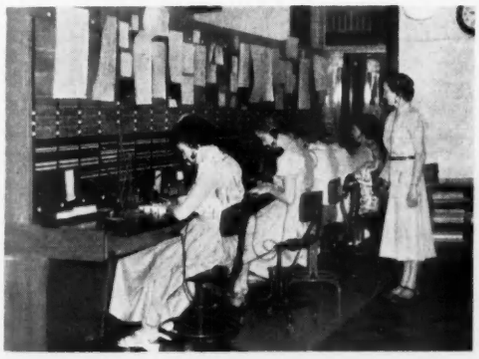
The South Penn Co. is in the process of converting outside exchanges to dial — 9 have been completed — before tackling the big job at Waynesburg. Mr. Scott himself has been the "engineer-mechanic" responsible for adding manual positions up to the present 12, and making the new work with the old.

Optimism?

The service area includes diversified agriculture, the giant U. S. Steel's "Robena" mine and many smaller coal mines, and repressured gas distributed by the Texas-Eastern's 24″ and 30″ mains. A college and normal county seat activities balance the economy.

Harvey Cree, commercial manager, shows Robert Scott (right) where a new customer has asked for service.

Mr. Scott wants to hurry his conversion program along. You see, he is vice-president of the Pennsylvania Association; normally in two years he will be president, where his seasoned experience will be a valuable contribution to association activities.

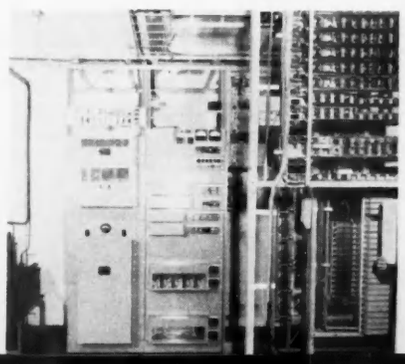


8-position No. 3 toll board. Mrs. Thirza Headlee, chief operator, assists as needed.

Robert Stockdale is wire chief at Waynesburg, Penna.

It takes a big group of well-trained operators to handle this busy city exchange.

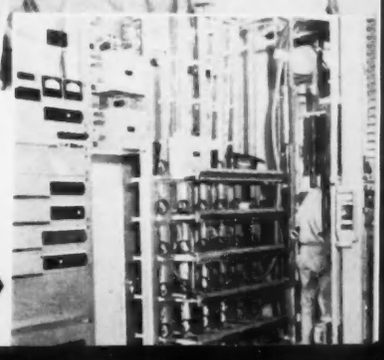
Two More Texas Towns Now Served By XY Dial



The eyes of Texas were upon Cross Plains recently when the Kizer Telephone Company celebrated their second cutover to XY® dial. Previously, the Rising Star exchange became a part of the XY family.

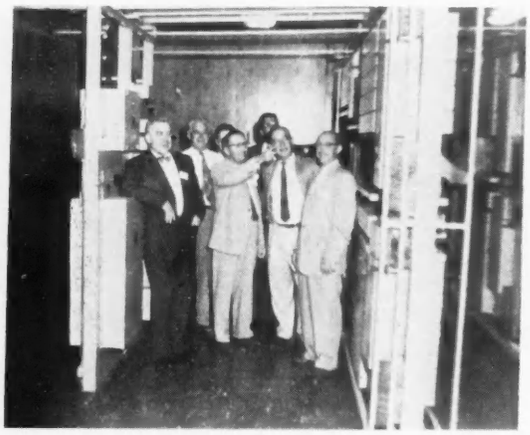
Present at the Cross Plains cutover were (l. to r.) H. Odum, installer; Ed Kizer, owner; E. G. Browell, Stromberg-Carlson representative; Ralph Kizer, son of the owner, and G. W. Stevens, installer.

Bottom, left and right: new Stromberg-Carlson XY equipment at Cross Plains.



STROMBERG-CARLSON transmitter

Another step forward: Goal almost reached



Attending the Mascoutah cutover, (l. - r.) Mr. Jenkins, board member; J. Hardy, secretary of Illinois Telephone Association; Ed Melcher, Illinois Commerce Commissioner; Oscar Krick, manager; M. T. Bolluyt, Stromberg-Carlson; Mr. Pfeifer, attorney and W. J. Pfaender, Stromberg-Carlson.

Mr. Eidman, president of Looking Glass Prairie Telephone Co. shows power board to visitors.

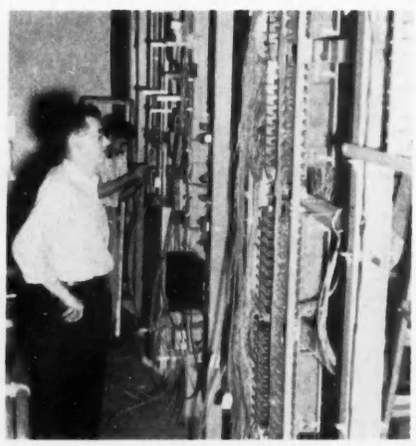
Mascoutah, Illinois, now has its 650-line XY Dial System in service and for Oscar Krick, manager of the Looking Glass Prairie Telephone Company and the neighboring Millstadt Telephone Company, it was a routine both familiar and exhilarating.

These two progressive companies operating under one managership now have XY® offices at New Baden, Fayetteville, Millstadt and Westview, with contracts already let for completing the dial program in the remaining offices.

The Mascoutah central office equipment is arranged for terminal-per-line operation, with station intercept through an XY Tape Announcer. A recorded message gives helpful information to the subscriber who has dialed a non-existent or temporarily disconnected number.

Officers and board members, proud of their new office and the company-wide progress, turned out in force despite the 6:00 A.M. cutover hour. Stromberg-Carlson sales representative M. T. Bolluyt, sales engineer Sidney Crook and service engineer Al Gear were on hand to see that the first calls went through smoothly.

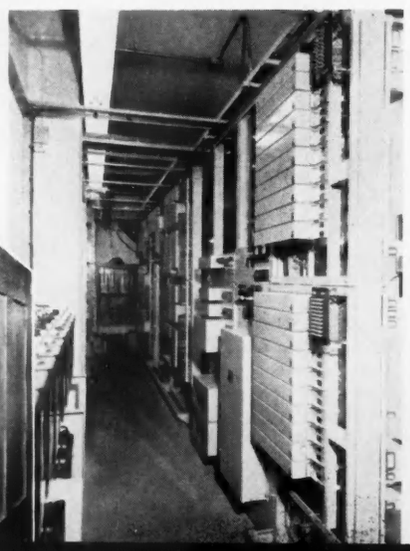
Rochester Telephone Corp. ready as University moves



Dick Brennan, Stromberg-Carlson installation foreman, sizes up the next move as equipment goes into place.

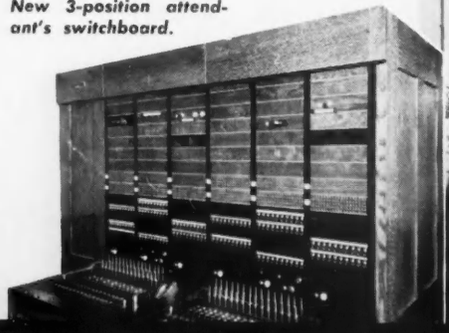
This fall is moving time at the University of Rochester, as hundreds of women students leave their present campus for a new location adjoining the Men's Campus. While carpenters and masons rush feverishly to meet their deadline the Rochester Telephone Corporation, with characteristic good planning, has already installed an XY® Dial PBX System adequate to properly serve both divisions of the University.

Coupled with the XY-PBX recently installed to serve Strong Memorial Hospital and the University Medical School, Rochester Telephone Corporation now has XY dial facilities in this one location alone equal in size and complexity to those of a fair sized city.

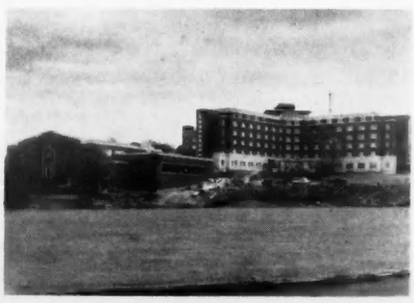


A good job, Dick. Telephone company and subscriber both pleased.

New 3-position attendant's switchboard.



This is part of the reason for new XY-PBX: the almost completed Women's Campus.



STROMBERG-CARLSON transmitter

Arthur B. Preble

Art Preble of Kansas City

Salesman, Leader, Gentleman

FOR many years you showed the way, planting interest, friendship and confidence among customers. Sales went into the record not only as equipment sold but even more as the cementing of good relationships for the future.

Others have followed to cultivate and reap the good harvest. With patience and understanding you led these men, suggesting how a fine performance could be made even better. Some profited by your training to take important posts elsewhere; others have remained to carry on the tradition established at Kansas City.

You have made service to your telephone customers a way of life. Fifty years would be a long time if it were not filled to the brim with satisfactions gained from the mutual respect and lasting friendship of those you have served.

To you, Art, and to Myrtle who has walked up the path by your side, a heartfelt thank-you for the help you have given us.

Your friends at Stromberg-Carlson

One man stole the show at a recent dinner in the Windsor Room of the Phillips Hotel in Kansas City. This was proper, for the men and women present—leaders in the Independent telephone industry from all sections—were there for one reason only: their friendship for Art Preble.

Retiring from the position of Manager Telephone Sales, Kansas City Branch, Art can look back over fifty years telephone service—mostly with Stromberg-Carlson — and know it's been a good job well done.

Art took to the telephone field naturally—father and three uncles were already in it. Starting with his father in Steubenville, Ohio, in 1905, Art later joined the Garford Manufacturing Co. When Stromberg-Carlson bought Garford in 1916, Art was "part of the deed." As installer, salesman and sales engineer he traveled every inch of the territory he has managed since 1945.

Always one to consider the future good of his customers, Art has organized a branch which will carry on in the same tradition. R. Fred Fairly, formerly senior sales engineer on the Pacific Coast, has already become acquainted with his duties as new manager at Kansas City Branch.

R. Fred Fairly

◀ *Art Preble (right) retiring manager at Kansas City, congratulates his successor, R. Fred Fairly, as (l-r) T. C. Thompson, Sales Manager; Arthur F. Gibson, Corporate Secretary and John H. Voss, Vice-President wait their turn.*

Co-workers and customers joined in the fete. Snapped at one of the many tables were (l. to r. around the table) Miss Ruth Atkinson, Kansas City, Mo.; Foster B. McHenry, Jefferson City, Mo.; Mrs. R. J. Cushing, Jefferson City; R. J. Fegan, Junction City, Kansas; Miss Clare Winterschridt, Miss Deanna Smithmier, Miss Donna L. Schuetz, all of Kansas City; R. J. Cushing, Jefferson City. ▶

STROMBERG-CARLSON **transmitter**

Growth and progress go hand in hand as Orting (Wash.) expands service with XY®

Sweet background music for Mr. and Mrs. Gately of Orting, Washington, as purring switches take over for the operators.

There was a time when operators at Orting, Washington, knew most of their subscribers by voice and name. This was fine for a small town and a more leisurely way of life.

Mr. A. R. Gately came to Orting as owner-manager eight years ago—there were only 273 subscribers then. He knew that the town, only a few miles from bustling Tacoma, would grow and that telephone service equal to the best would be expected. The more than 700 subscribers today attest to the growth; this summer a modern dial central office was cut into service. As an added convenience Mr. Gately has provided toll-free service to the South Prairie exchange which was purchased a year ago to round out his system.

He has a surprise for you!

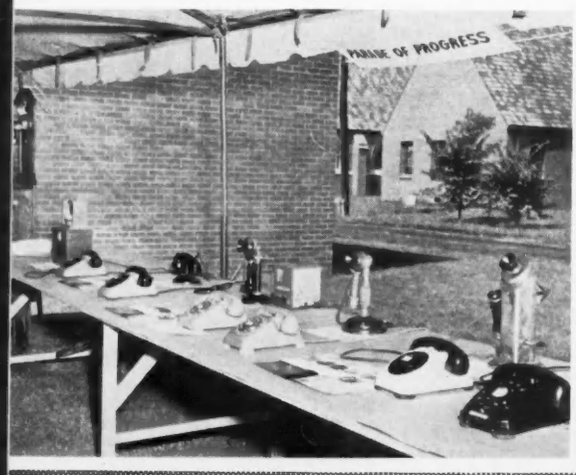
T. C. Thompson stands guard outside Stromberg-Carlson plant. The secret he's keeping under his hat is obviously a big one.

You can be there when the sensational news is announced: Rooms 504-A, 505-A, 507-A, 509-A in the Conrad Hilton Hotel, Chicago, during U.S.I.T.A. Convention, Oct. 10, 11, 12.

A Tentful of Southern Hospitality at Crossett, Arkansas

Jack Tucker of Crossett, Arkansas, combined real southern style hospitality with the opportunity to show his subscribers and neighboring managers what has recently been accomplished in his exchange. It's all part of a pattern wherein the new Crossett (described in the January 1955 TRANSMITTER) has emerged from a paternal company domain to a citizen-run city that knows only one direction to go: forward. Leader in this movement is Jack Tucker and the telephone company.

Roscoe Morgan, equipment man, explains operation of dial system to two interested subscriber-guests.



Telephones over the years always attract interest. Jack Tucker, Crossett manager, shows instruments to Mr. & Mrs. L. L. Thornton of Waldron and Carl Moore of Harrison, Arkansas.

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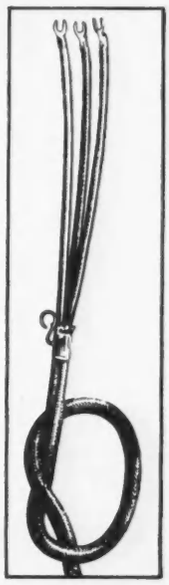

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CORDS FOR ALL MAKES AND TYPES OF TELEPHONE INSTRUMENTS

the BACK of the BOOK

By John G. Reynolds

Got Troubles? Try Malaya

MAINTENANCE of communications has been one long struggle in Malaya, a country about the size of England, four-fifths of its area covered by dense tropical jungle. White ants, which have been known to eat through the lead sheaths of underground cable, devoured wooden poles in spite of the large amounts of preservative used. Iron poles were an effective solution for a time. Then, in some areas, elephants used them for back-scratchers and in the process frequently pushed them over. Special installations finally solved that problem, too, and the last reported such uprooting occurred in 1950.

"Designing For People"

"OF ALL THE MAGIC of modern civilization, the telephone seems to me the most wondrous achievement," writes Henry Dreyfuss, noted industrial designer, in his new book, "Designing for People."

Mr. Dreyfuss has been pretty close to one particular type of telephone in recent years. He helped design Bell's "500" set. He also has been a consultant with the Bell Laboratories on a number of other developments.

In his book, Mr. Dreyfuss continues:

"How easily we take it for granted that the simple, commonplace spinning of a dial will enable us to talk privately and intimately with a particular person across a city or a continent or a ship at sea or in an auto or a plane several miles in the sky. We assume that the telephone will be there, within reach, in time of stress, to reassure one's family and friends or to transact business."

From Out of The Past

THE LAYING of the first transatlantic *telephone* cable this Summer inevitably brings to mind the laying of the first transatlantic *telegraph* cable. According to "Bell Telephone Magazine" that event of 1858 created a furor which seems almost unbelievable 97 years later. *Frank Leslie's Illustrated Newspaper* of September 11 devoted an entire page of the minute type of that era to a listing of the events of September 1, beginning with services in Trinity Church at 10 A.M.; then a monster parade of 11 divisions of military and civilian organizations, estimated to include about 15,420 persons; and a reception for Cyrus W. Field, the cable's sponsor, in the Crystal Palace which was attended by "at least" 10,000 persons. A mammoth display of fireworks that evening set fire to City Hall and burned off the cupola, but that seemed not out of keeping with the general excitement of the day.

The reason for all this probably lay in the real importance of the cable. For at one stroke it linked England and the United States with the speed of electrical communication. No longer were news, people's messages, the world's business dependent on ships for transportation. The cable was an emotional as well as a physical tie that bound, and the celebration expressed what the people felt.

Unfortunately, it was all an enormous anti-climax, for transmission over the cable failed that very day. Field promoted another cable, which broke in mid-Atlantic, and, indomitable, a third, in 1866, which succeeded, and justified all the vision, the courage, the hope, and the money which went into the venture.

Today's project has its roots in those past events, of course, and links with those earlier days are not lacking. Field sold what was left over from his first cable to Tiffany and Company, New York jewelers, and the latter cut it up and sold short pieces as souvenirs. These, with certificates of authenticity signed by Field, were immensely popular at the time, and some still exist in museums and probably in drawers and attics of old residences. Their current scarcity is attested by the year-and-a-half it took a Long Lines man to lay his hands on one.

Anniversary Of A Revolution

THE PEOPLE who visited the campus of Michigan State College at East Lansing during the August 15-20 period were fortunate. There they saw the Centennial of Farm Mechanization — which marks one of the great peaceful revolutions of history.

Until a century ago farming methods had changed but little since human life began. This meant that the dawn-to-dark work of the great majority of the population had to be devoted to producing food and fiber. Now a relatively small minority can produce an abundance of food for everyone — so the rest of us can work at producing all the other goods and services which contribute to the American standard of living.

This is why the Centennial is not just significant to the farmer. Farm mechanization has had a tremendous influence on urban life as well. Progress in industry and progress in agriculture go hand in hand, and one would be impossible without the other.

The observance at Michigan State was a full-dress affair, with more than 100 acres of space devoted to exhibits and demonstrations and pageants. Complete exhibits in such fields as machinery, soil and water, rural electrification and transportation, home equipment and on down a long list were seen. The hundreds of thousands of people who attended had a rewarding experience.

need speed?

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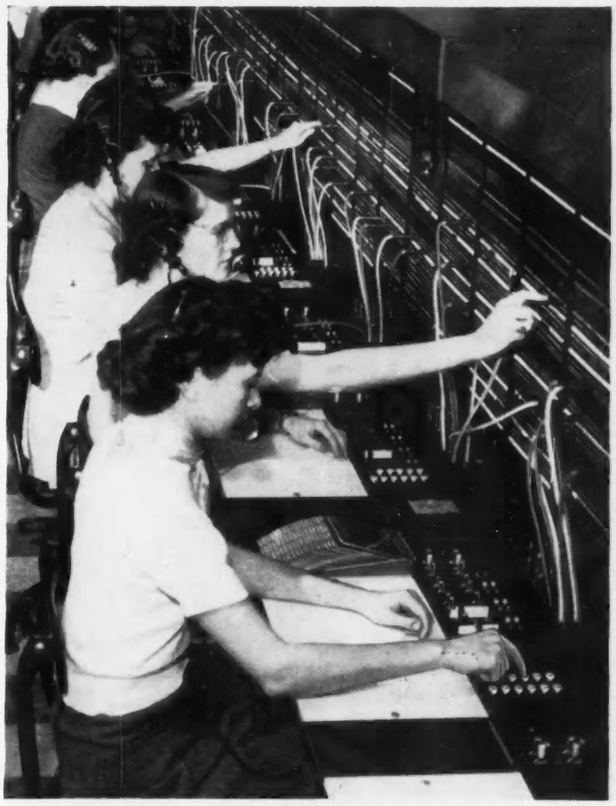
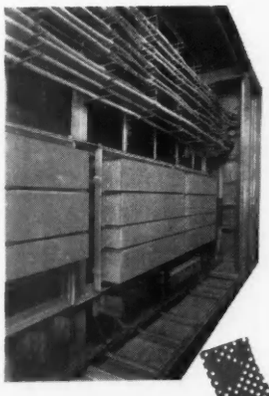
Operating companies using Type 31 find that its efficiency-boosting features are a boon in Nationwide Toll Dialing



Key-sending operation (as used in 56-position Lincoln, Nebr., installation shown) or dial operation can be provided. Pneumatic tubes can be furnished to speed handling of toll tickets, or a track-type ticket-carrying system can be use.

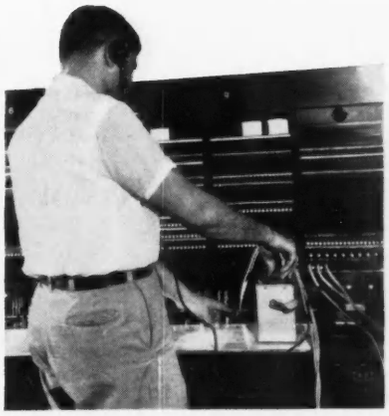


FAST INSTALLATION:

Type 31 is supplied in two-position, five-panel sections which are exceptionally complete and self-contained. Each line and trunk circuit mounts as a unit on the relay rack, and is wired to a self-contained terminal block. No preformed local cables needed. Simple jumper wiring connects ground, battery, and signal leads.

FAST MAINTENANCE:

Portable test set supplied enables man to check wiring and equipment balance in cord and position circuits from front of board—no need to remove rear panel. Built-in equipment allows easy testing of front and rear cords for ringing, supervision and pad control battery, plus testing of coin collect and return. Provision also made for checking dialing, key-sending, and automatic ring.



FAST OPERATION:

New twin-pocket ticket holder keeps each ticket beside the cord circuit concerned — avoids confusion, speeds ticket handling. Supervisory lamps for each cord circuit are mounted on same escutcheon as "talk" and "ring" keys — no need to look from key to jack panel. Ample key-shelf space provided for easy writing and for a work-speeding bulletin-holder and calculagraph.

Get full facts on how Type 31 Toll Board will save you money. Send for Circular TM 1838. *Address: Automatic Electric Sales Corporation, 1033 W. Van Buren St., Chicago 7. Or, call HAymarket 1-4300.*

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